

INDIA FOR THE 1st HALF OF OCTOBER 1882.

IN SEERS OF 80 TOLAHS.

### PROVINCES.

MADE IN U.S.A.

УЧУЮ.

—

\* The Collector attributes the rise in the price of firewood to the recent rains which resulted in the ryots who dealt in firewood directing their attention to cultivation.

## PRICES CURRENT OF FOOD-GRAINS THROUGHOUT

QUANTITIES PER RUPEE

PROVINCES.	DISTRICTS.																		
		Wheat.			Barley.			Rice (best sort).			Rice (common).			Great Millet (Cholum, Jowar), Hoicus Sorganum.			Bairash Millet (Cumboo, Baira), Pentecillaria Spont.		
		Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.
		S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.
<i>Central Districts.</i>																			
	Calcutta	13 5	13 11	14 0	24 8	26 14	32 0	10 0	10 0	8 0	20 0	20 0	16 0	...	...	...	...	...	...
	24-Pergunnahs	13 5	13 5	13 5	20 0	20 0	28 0	10 8	10 8	10 0	17 0	17 8	20 0	...	...	16 0	...	...	...
	Nuddea	13 5	14 4	16 0	24 10	26 0	35 8	15 4	16 0	16 0	20 0	19 0	21 5	...	...	...	...	...	...
	Khoolna	...	...	...	...	...	...	16 0	16 0	...	22 0	22 0	...	...	...	...	...	...	...
	Jessore	10 0	13 0	13 12	...	...	...	16 0	16 0	20 0	21 4	21 4	29 0	...	...	...	...	...	...
	Moorsheadabad	16 0	16 0	16 0	...	...	...	14 6	15 0	15 0	21 4	21 4	26 0	...	...	...	...	...	...
	Dinagapore	13 4	13 4	14 0	14 0	14 0	20 0	20 0	19 8	16 8	26 0	24 0	27 8	...	...	...	...	...	...
	Rajshahye	13 8	13 8	15 0	32 0	32 0	45 0	16 13	13 8	15 0	17 4	18 8	24 12	...	...	...	...	...	...
	Rungpore	14 4	14 4	18 0	...	...	...	14 0	15 0	15 0	20 0	23 0	20 0	...	...	...	...	...	...
	Bogra	16 0	16 0	15 0	...	...	...	14 0	15 0	15 0	20 0	23 0	20 0	...	...	...	...	...	...
	Bogra	17 8	18 12	19 8	...	...	...	18 0	18 0	18 12	26 4	27 3	30 0	...	...	...	...	...	...
	Pubna	17 4	18 0	18 0	...	...	...	9 4	10 0	9 0	22 8	24 0	26 8	...	...	...	...	...	...
	Darjeeling	8 0	8 0	8 0	8 0	8 0	8 0	5 0	5 0	5 0	12 0	12 0	10 0	...	...	...	...	...	...
	Jalpaiguri	10 0	10 0	9 0	20 0	20 0	...	14 0	14 0	12 4	20 0	20 0	18 0	...	...	...	...	...	...
<i>Eastern Districts.</i>																			
	Dacca	13 12	13 5	13 5	40 0	32 0	35 8	22 10	22 0	26 0	26 8	30 0	29 0	...	...	...	...	...	...
	Furzedpore	20 0	20 0	27 0	37 8	37 8	30 0	20 8	21 0	8 0	22 0	22 0	25 0	...	...	...	...	...	...
	Backergunge	...	...	...	...	...	...	18 0	19 0	21 0	23 0	23 0	28 8	...	...	...	...	...	...
	Mymensingh	11 8	11 8	13 0	...	...	...	26 8	20 0	24 0	27 8	26 0	25 0	...	...	...	...	...	...
	Tipperah	11 8	11 8	13 0	...	...	...	19 4	21 5	26 0	27 12	31 8	36 0	...	...	...	...	...	...
	Chittagong	9 0	9 0	11 4	...	...	...	14 0	12 8	16 0	22 8	22 8	23 0	...	...	...	...	...	...
	Nonkholly	...	...	...	...	...	...	22 0	22 0	21 0	26 0	26 0	25 0	...	...	...	...	...	...
	Chittagong Hill Tracts	...	...	...	...	...	...	13 5	13 5	16 0	16 0	17 12	17 12	...	...	...	...	...	...
	Hill Tipperah	10 0	10 0	10 0	...	...	...	20 0	21 0	20 0	28 0	28 0	28 0	...	...	...	...	...	...
<i>Behar.</i>																			
	Patna	22 0	22 0	24 0	28 0	28 0	40 0	14 0	14 0	14 0	22 8	22 8	22 0	...	...	...	...	...	...
	Gya	18 0	17 0	20 8	23 8	24 0	38 0	12 8	12 0	12 8	19 0	17 8	22 8	...	...	...	...	...	...
	Shahabad	16 8	16 0	16 0	26 0	25 8	36 0	17 0	17 0	20 0	18 0	18 0	22 0	...	...	...	...	...	...
	Darbhanga	14 0	14 0	15 0	30 0	30 0	35 0	13 0	14 0	13 0	16 0	17 0	17 0	...	...	...	...	...	...
	Muzafferpore	16 0	16 0	17 0	40 0	40 0	40 0	12 0	12 0	12 0	17 0	17 0	18 0	...	...	...	...	...	...
	Saran	16 8	16 8	16 8	28 0	28 0	40 0	10 0	10 0	10 0	21 0	19 8	22 0	35 0	34 0	39 0	...	...	...
	Chumpran	17 0	18 0	21 0	32 0	36 0	50 0	14 0	12 0	14 0	21 0	18 0	28 0	...	...	...	...	...	...
	Monghyr	17 13	17 13	17 13	36 12	31 8	42 0	15 12	15 12	14 11	17 13	17 13	21 0	...	...	...	...	...	...
	Bhagulpur	15 2	15 2	14 6	35 5	37 14	46 0	17 11	17 11	17 11	19 9	20 3	20 3	...	...	...	...	...	...
	Purneah	14 0	14 0	16 0	...	...	50 0	18 0	20 0	21 0	20 0	24 0	30 0	...	...	...	...	...	...
	Maldah	17 0	17 0	16 0	...	...	...	20 0	16 0	15 0	22 0	22 0	25 0	...	...	...	...	...	...
	Sonthal Pergunnahs	13 0	13 0	11 4	...	...	...	16 0	16 0	21 0	22 0	22 0	25 0	...	...	...	...	...	...
<i>Orissa.</i>																			
	Cuttack	15 12	14 7	17 1	...	...	...	15 12	15 12	15 12	26 4	26 4	24 15	...	...	...	...	...	...
	Pooree	9 0	10 4	13 2	...	...	...	19 0	20 0	20 0	25 0	25 0	25 0	...	...	...	...	...	...
	Balsore	14 0	14 0	13 0	...	...	...	25 0	25 0	22 0	28 0	28 0	32 0	...	...	...	...	...	...
<i>Chota Nagpore—South-Western Frontier Agency.</i>																			
	Hazaribagh	13 0	13 0	18 0	18 0	17 0	...	10 0	10 0	13 0	18 0	19 0	22 0	...	...	...	...	...	...
	Lohardugga	14 0	14 0	16 0	20 0	20 0	24 0	20 0	20 0	22 0	22 0	22 0	24 0	...	...	...	...	...	...
	Singbhoom	20 0	20 0	24 0	28 0	28 0	40 0	36 0	36 0	32 0	40 0	40 0	36 0	...	...	...	...	...	...
	Manbhoom	13 0	12 0	13 8	...	...	...	17 0	18 0	22 0	31 0	28 0	34 0	...	...	...	...	...	...

\* In the interior retail price of common rice varies from 31-3 to 39-6 seers per rupee.

† In the sub-divisions retail prices of salt are as follow:—Baraset and Bassirhat 13 seers, Diamond Harbour and Barripore 10-8 seers, Barrackpore 12-12 seers, and Dam-Du 12 seers.

‡ In the sub-divisions retail prices of salt are as follow:—Koochtea and Bongong 13 seers, Meherpore 10-4 seers, Choondanga 12 seers, and Ranaghat 12-10 seers.

§ In the sub-divisions retail price of salt is 11 seers per rupee.

|| In the sub-divisions retail price of salt is 12 seers per rupee.

¶ In the sub-divisions retail prices of salt are as follow:—Laibagh 11 seers, and Jungpore and Kandi 11-8 seers.

\* In the sub-divisions retail prices of salt are as follow:—Raigunge 9 seers and Nitpore 12 seers.

† In Natore retail price of salt is 12 seers per rupee.

‡ In the sub-divisions retail prices of salt are as follow:—Nilphamari 12 seers and Gaibanda 11 seers.

§ In the sub-divisions retail price of salt is 14 seers per rupee.

|| In the sub-divisions retail prices of salt are as follow:—Kurseong 8 seers and Silligori 10 seers.

¶ In the sub-divisions retail price of salt is 10-8 seers per rupee.

\* In the sub-divisions retail prices of salt are as follow:—Manickgunge 12 seers, Moonsheegunge 10 seers, Chittack, and Naraingunge 13-8 seers.

† In the sub-divisions retail prices of salt are as follow:—Gualundo 10 seers, Madaripore 13 seers, and Bhang and Uopalgunge 12 seers.

‡ In the sub-divisions retail prices of salt are as follow:—Patakhali 10-10 seers, Poroze 11 seers, and Bhoia 9 seers.





## PRICES CURRENT OF FOOD-GRAINS THROUGHOUT

QUANTITIES PER RUPEE

		QUANTITIES PER RUPEE																							
PROVINCES.	DISTRICTS.	Wheat.			Barley.			Rice (best sort).			Rice (common).			Great Millet (Chotum, Jowar), Hoicus Sorghum.			Bulrush Millet (Cumboo, Baira), Pennisetaria Spicata.								
		Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.						
		S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.					
ASSAM.	Sylhet . . . . .	No return received			...			...			...			...			...			...					
	Cachar . . . . .	No return received			...			...			...			...			...			...					
	Golpara . . . . .	No return received			...			...			...			...			...			...					
	Garo Hills . . . . .	No return received			...			...			...			...			...			...					
	Kamrup . . . . .	No return received			...			...			...			...			...			...					
	Darrang . . . . .	No return received			...			...			...			...			...			...					
	Nowgong . . . . .	No return received			...			...			...			...			...			...					
	Sibsagar . . . . .	No return received			...			...			...			...			...			...					
	Lakhimpur . . . . .	No return received			...			...			...			...			...			...					
	Khási & Jaintia Hills . . . . .	No return received			...			...			...			...			...			...					
	Naga Hills . . . . .	No return received			...			...			...			...			...			...					
N. W. PROVINCES.	Dehra Dún . . . . .	No return received			...			...			...			...			...			...					
	Saharanpur . . . . .	20 15 20 7 19 6 32 4 31 3 37 12	10 12 9 11 7 9			13 15 12 14 14 0			30 1 32 4 32 5 25 13 23 10 27 9																
	Muzaffarnagar . . . . .	19 12 19 12 19 4 30 13 28 11 35 5	6 9 6 9 6 9			14 5 14 5 13 4			33 0 33 0 26 6 24 6 24 6 19 12																
	Meerut . . . . .	19 0 19 8 20 0 27 0 27 0 30 0	6 0 6 0 5 8			15 0 15 0 13 0			27 0 27 0 25 0 23 0 21 0 20 0																
	Bulandshahr . . . . .	20 12 19 10 20 6 24 0 25 8 29 0	6 0 6 0 6 0			10 5 10 5 11 0			25 8 24 0 26 0 23 0 20 0 24 8																
	Aligarh . . . . .	18 4 18 8 18 4 23 0 24 0 24 8	7 0 6 8 6 0			12 8 13 0 15 0			24 0 25 0 21 0 23 8 23 8 21 8																
	Kumaun . . . . .	No return received			...			...			...			...			...								
	Garhwál . . . . .	No return received			...			...			...			...			...								
	Bijnor . . . . .	No return received			...			...			...			...			...								
	Moradabad . . . . .	19 6 19 11 20 5 23 2 23 2 28 2	9 6 9 6 8 2			14 6 13 2 15 0			26 4 26 4 26 4 18 2 18 2 23 12																
	Budoun . . . . .	17 13 18 0 19 10 22 3 23 1 27 14	9 9 9 9 6 0			17 11 18 0 16 3			25 0 25 0 25 0 21 9 21 9 21 18																
	Bareilly . . . . .	16 14 17 3 17 8 21 14 21 4 23 12	8 2 8 2 7 8			15 0 14 6 13 12			25 0 25 0 25 0 22 21 22 21 4 20 0																
	Sháhjahanpur . . . . .	18 8 19 2 19 4 24 8 25 0 27 12	9 4 9 4 8 0			19 8 19 12 17 8			25 0 25 0 25 0 22 15 22 15 15 0																
	Tarái Pergunnahs . . . . .	22 0 22 0 22 8 32 0 32 0 35 0	10 0 10 0 10 0			17 0 15 0 15 0			25 0 25 0 25 0 22 15 22 15 15 0																
	Muttra . . . . .	17 12 17 8 17 12 25 8 24 0 23 0	6 0 6 0 7 2			14 0 14 0 14 0			24 0 24 0 21 0 24 0 23 0 21 0																
	Agra . . . . .	17 4 17 8 18 0 25 0 25 0 23 0	6 0 6 0 6 2			14 4 13 6 15 8			26 0 26 0 20 0 24 0 23 0 21 0																
	Farukhabad . . . . .	17 2 17 8 17 13 22 0 22 3 24 14	6 13 6 13 6 2			14 4 13 6 15 8			24 5 24 8 22 5 22 12 22 0																
	Mainpuri . . . . .	18 8 18 8 17 0 23 0 24 0 21 0	5 0 5 0 6 0			10 0 11 0 12 0			25 0 25 0 25 0 22 15 22 15 15 0																
	Etáwsh . . . . .	18 8 19 0 16 8 22 8 25 8 22 0	6 0 6 0 6 0			14 8 14 8 14 8			27 0 25 8 20 0 24 0 23 8 18 8																
	Etah . . . . .	19 1 19 0 17 12 24 8 25 3 20 0	8 11 7 11 6 0			13 8 13 0 12 0			23 0 22 0 22 0 22 0 20 0 18 0																
	Jaloun . . . . .	17 8 17 0 19 0 30 0 30 0 20 0	10 0 10 0 8 0			13 0 13 0 13 0			28 0 28 0 28 0 26 0 26 0 23 0																
	Jhansi . . . . .	21 10 21 3 24 2 30 15 31 15 29 2	8 0 8 0 8 0			15 0 15 0 15 0			28 0 28 0 28 0 26 0 26 0 23 0																
	Lalitpur . . . . .	20 8 20 8 27 8 35 0 37 0 34 0	11 0 11 0 9 0			13 0 13 0 13 0			28 0 28 0 28 0 26 0 26 0 23 0																
	Cawnpore . . . . .	18 0 19 0 20 12 26 0 27 8 27 8	11 0 11 0 11 0			15 0 14 8 16 0			27 0 28 0 29 0 27 0 25 0 26 0																
	Fatehpur . . . . .	16 10 16 10 17 8 24 8 24 4 22 8	12 12 13 8 12 0			19 0 16 0 19 2			25 0 25 0 25 0 23 0 23 0 20 0																
	Banda . . . . .	17 8 17 8 18 0 22 0 21 0 22 0	9 0 8 0 10 0			16 0 14 0 15 8			33 0 34 0 23 0 30 0 30 0 22 0																
	Allahabad . . . . .	17 2 17 8 17 8 25 0 25 4 23 8	11 8 12 0 11 0			18 0 16 0 19 0			31 0 32 8 28 0 29 8 31 0 27 0																
	Hamirpur . . . . .	15 14 16 14 16 0 18 0 18 0 22 8	10 0 11 4 10 2			16 5 16 5 16 5			27 0 29 8 23 14 27 2 27 0 21 0																
	Jaunpur . . . . .	19 0 18 5 20 7 29 10 28 15 31 12	7 12 7 1 7 12			15 8 15 8 16 15			19 11 19 12 19 11																
	Gorakhpur . . . . .	18 14 18 14 20 13 27 0 27 0 46 12	14 6 14 6 14 6			21 9 19 13 21 9			34 3 36 0 50 6 19 11 19 12 19 11																
	Basti . . . . .	18 8 18 0 21 0 28 0 28 0 40 0	16 0 16 0 13 8			20 0 20 0 17 0			20 10 20 10 20 10																
	Azamgarh . . . . .	17 11 16 4 20 10 24 6 24 6 32 9	10 9 11 9 10 5			14 12 17 11 17 7			20 10 20 10 20 10																
	Mirzapur . . . . .	15 0 15 0 17 0 20 0 21 0 25 0	10 0 10 0 10 0			16 0 16 0 18 0			27 0 26 0 26 0 24 0 24 0 24 0																
	Benares . . . . .	No return received	...			...			...			...			...			...							
	Ghazipur . . . . .	18 0 18 0 19 5 26 6 27 11 37 8	10 15 10 15 10 15			15 7 16 1 19 5			25 12 25 12 30 10 23 3 21 14 30 1																
	Balia . . . . .	16 8 16 4 19 6 25 0 27 8 38 12	10 0 10 0 10 0			15 0 15 0 21 4			25 12 25 12 30 10 23 3 21 14 30 1																
	Pilibhit . . . . .	No return received	...			...			...			...			...			...							
OUDH.	Lucknow . . . . .	17 12 17 13 18 4 25 2 25 3 26 12	6 0 6 0 6 0			16 5 15 0 18 0			24 8 24 8 26 8 24 0 24 0 24 0																
	Unao . . . . .	18 0 18 0 18 0 25 0 27 0 24 0	11 0 11 0 10 0			15 0 15 0 16 0			23 0 36 0 32 0 25 0 24 0 22 0																
	Bára Banki . . . . .	18 0 18 0 19 0 25 0 24 0 28 0	11 0 11 0 9 0			18 0 16 0 19 0			35 0 36 0 35 0 20 0 20 0 20 0																
	Sitapur . . . . .	19 8 19 9 21 10 25 4 26 9 29 12	8 0 8 0 8 0			21 0 18 12 19 6			25 0 25 0 25 0 22 8 22 8 22 8																
	Hardoi . . . . .	17 1 17 1 20 5 23 7 24 6 33 12	5 10 5 10 5 10			10 0 11 0 13 2			21 9 21 9 21 9 22 8 22 8 22 8																
	Kheri . . . . .	19 0 19 0 22 8 25 0 25 0 34 0	8 0 8 0 9 0			18 0 20 0 18 0			44 0 45 0 45 0 45 0 45 0 45 0																
	Fyzabad . . . . .	17 2 16 14 18 0 26 12 27 4 28 0	11 0 11 0 10 8			19 6 18 12 15 0			35 0 40 0 35 0 35 0 35 0 35 0																
	Bharsaich . . . . .	17 0 16 0 19 0 29 0 30 0 38 0	12 0 9 0 9 0			18 0 17 0 16 0			52 0 56 0 50 0 13 0 13 0 16 0																
	Gonda . . . . .	19 12 20 4 23 4 28 0 28 0 41 0	16 4 16 4 16 4			19 4 18 12 20 8			44 0 40 0 63 0 24 0 24 0 24 0																
	Rai Bareli . . . . .	18 12 19 0 18 12 27 8 26 0 21 8	17 4 16 8 19 0			24 0 25 0 23 0			23 8 20 0 25 0 23 8 20 0 25 0																
PUNJAB.	Sultanpur . . . . .	20 0 20 0 21 0 31 0 31 0 31 8	11 0 11 0 11 0			20 0 20 0 22 0			20 0 20 0 20 0 20 0 20 0																
	Partabgarh . . . . .	18 11 19 4 19 4 28 1 28 12 29 8	17 4 18 4 18 0			18 10 19 12 20 4			20 0 20 0 20 0 20 0 20 0																
	Delhi . . . . .	20 0 19 0 18 0 26 0 24 0 27 0	...			13 0 13 0 13 0			28 0 27 0 26 0 23 0 21 0 21 0																
	Gurgaon . . . . .	20 0 19 12 20 8 28 0 27 2 29 0	...			13 0 13 0 13 0			28 0 25 12 23 8 27 0 25 12 23																
	Karnal (a) . . . . .	20 0 20 8 20 0 31 0 31 0 35 0	...			13 0 13 0 13 0			35 0 30 0 30 0 20 0 18 0 25 0																
	Hissar . . . . .	17 8 17 0 20 0 33 0 32 0 27 0	...			10 0 10 0 10 0			34 0 32 0 33 0 28 0 27 0 28 0																
	Rohatak . . . . .	18 0 17 8 21 8 25 0 24 0 24 0	...			9 0 9 0 9 0			26 0 24 0 23 0 24 0 23 0 26 0																
	Sirsa (b) . . . . .	23 0 22 8 20 0 43 0 38 0 32 0	...			12 0 12 0 12 0			44 0 38 0 30 0 35 0 32 0 30 0																
	Umbaila (a) . . . . .	24 0 24 8 21 4 33 0 32 0 34 0	...			13 0 12 0 13 0			36 0 32 0 32 0 26 0 26 0 22 0																
	Ludhiana . . . . .	23 0 25 0 21 8 37 0 37 0 34 0	...			12 8 12 0 12 0			40 0 40 0 32 0 25 0 23 0 25 0																



INDIA FOR THE 1st HALF OF OCTOBER 1882—continued.

IN SEERS OF 80 TOLAHS.

[illegible]

## PRICES CURRENT OF FOOD GRAINS THROUGHOUT

QUANTITIES PER RUPEE

PROVINCES.	DISTRICTS.	Wheat.			Barley.			Rice (best sort).			Rice (common).			Great Millet (Choum, Jowar), Eleusine Scirgum.			Bulrush Millet (Cumboo, Bajra), Pennisetia Spicata.		
		Present fortnight.	Past fortnight.	Corresponding fort- night of 1881.	Present fortnight.	Past fortnight.	Corresponding fort- night of 1881.	Present fortnight.	Past fortnight.	Corresponding fort- night of 1881.	Present fortnight.	Past fortnight.	Corresponding fort- night of 1881.	Present fortnight.	Past fortnight.	Corresponding fort- night of 1881.	Present fortnight.	Past fortnight.	Corresponding fort- night of 1881.
		S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.
PUNJAB—continued.	Amritsar . . .	25 8	25 8	23 0	43 8	43 8	33 0	...	...	...	14 8	12 8	11 4	31 4	29 4	28 0	23 8	23 8	19 0
	Siālkot (a) . .	29 0	27 0	20 0	50 0	44 0	33 0	...	...	...	14 0	14 0	14 0	34 0	28 0	24 0	25 0	21 0	17 0
	Gurdāspur . .	30 0	30 0	24 0	45 0	42 0	28 0	...	...	...	16 0	16 0	12 0	28 0	28 0	20 0	14 0	14 0	13 0
	Lahore . . .	26 0	25 0	21 0	48 0	48 0	29 0	...	...	...	13 0	11 0	10 0	30 0	30 0	23 0	27 0	24 0	16 0
	Ferozepore . .	25 0	25 0	19 0	42 0	42 0	30 0	...	...	...	11 0	11 0	11 0	...	...	...	...	...	...
	Gujranwāla (b) .	26 12	27 0	20 0	50 0	45 0	32 8	...	...	...	14 0	14 0	13 0	35 0	35 0	20 0	25 0	25 0	14 0
	Rāwalpindi (c) .	23 12	22 0	14 4	37 0	35 8	24 4	...	...	...	14 0	11 12	7 8	40 0	32 0	21 0	33 0	25 0	18 0
	Jhelum (b) . .	25 0	24 0	17 12	39 8	35 0	24 8	...	...	...	10 0	10 0	8 0	27 0	26 0	21 0	26 0	25 0	...
	Gujrat (c) . .	28 8	27 0	20 12	46 0	45 8	32 8	...	...	...	12 0	12 0	8 0	36 0	32 0	31 0	33 0	29 8	29 8
	Shahpūr (c) . .	22 12	21 0	16 0	32 0	32 0	26 0	...	...	...	12 0	12 0	11 0	28 0	22 0	18 0	28 0	21 0	18 0
	Mooltan . . .	17 4	17 0	14 4	30 0	29 0	20 8	...	...	...	10 0	10 0	8 0	30 0	30 0	21 0	24 0	24 0	17 0
	Jhang (d) . .	19 12	19 4	15 12	36 0	33 0	27 0	...	...	...	10 0	10 0	8 12	22 0	25 0	20 0	14 0	20 0	18 0
	Montgomery (b) .	21 0	20 0	15 8	30 0	24 0	20 0	...	...	...	5 8	5 8	5 8	...	20 0	...	...	16 0	...
	Muzaffargarh (e) .	18 8	18 8	16 0	26 0	26 0	22 0	...	...	...	7 0	7 0	5 0	18 0	18 0	14 0	22 0	18 0	16 0
	Dera Ismail Khān (e)	20 8	20 10	16 14	27 10	28 0	25 8	...	...	...	9 3	9 1	7 8	37 132	434	527	1527	425	1
	Dera Ghāzi Khān .	18 12	18 12	15 5	23 12	22 8	20 0	...	...	...	7 8	7 8	7 8	45 0	35 0	25 0	34 0	633	1223
	Bannu (e) . .	30 10	30 0	19 6	45 0	42 2	30 10	...	...	...	10 0	10 0	6 14	28 426	619	015	1214	020	13
	Peshāwar . . .	19 0	18 12	10 15	36 10	35 6	26 8	...	...	...	9 8	9 8	7 9	28 426	619	015	1214	020	13
	Kohāt (f) . .	18 8	17 3	13 12	29 5	30 4	25 8	...	...	...	13 0	12 2	10 3	28 022	416	529	521	10	...
	Hāzara (b) . .	25 8	23 12	...	41 0	32 0	28 8	...	...	...	12 0	11 8	...	...	...	...	...	...	...
CENTRAL PROVINCES.	Nāgpur . . .	17 12	17 0	15 0	...	...	...	9 12	9 8	9 4	17 4	16 0	15 0	25 12	26 12	28 8	...	...	...
	Bhandāra . . .	19 0	18 12	20 0	...	...	...	10 0	10 0	10 0	22 8	21 4	16 4	22 023	024	12	...	...	...
	Chānda . . .	No return received	...	...	...	...	...	8 12	8 12	8 12	14 12	14 12	11 12	23 023	030	0	...	...	...
	Wardha . . .	18 12	18 8	20 8	...	...	...	15 0	15 0	15 0	28 0	28 0	27 0	...	...	...	...	...	...
	Bālaghat . . .	18 0	17 0	25 0	...	...	...	11 0	10 0	9 0	15 0	14 0	14 0	25 017	026	0	16 015	817	8
	Jubbulpore . .	17 8	17 0	19 0	27 0	20 0	19 0	9 0	8 0	8 0	10 0	9 0	9 0	...	...	...	...	...	...
	Saugor . . .	20 0	18 8	34 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Damoh . . .	No return received	...	...	...	...	...	12 8	13 8	14 0	19 0	19 0	19 0	...	...	...	...	...	...
	Seoni . . .	17 8	18 0	23 0	...	...	...	15 8	15 0	15 8	20 0	18 8	21 8	...	...	...	...	...	...
	Mandla . . .	20 0	19 0	30 0	...	...	...	9 0	9 0	13 0	10 0	10 0	14 0	20 020	040	0	...	...	...
	Betul . . .	15 0	16 0	28 0	...	...	...	9 0	9 0	10 0	13 0	13 0	15 0	23 023	038	0	...	...	...
	Chhindwāra . .	17 0	17 0	26 0	...	...	...	4 8	4 8	4 0	11 4	11 4	9 8	23 1027	4	...	23 1027	417	8
	Hoshangabad . .	15 7	15 7	17 12	...	...	...	10 0	10 0	9 8	13 0	13 0	11 8	...	...	...	...	...	...
	Narsinghpur . .	16 0	16 0	19 8	...	...	...	12 8	12 0	11 8	30 030	045	0	24 1525	034	0	...	...	...
	Nimār . . .	16 0	16 0	16 0	...	...	...	21 0	20 0	21 0	41 0	40 0	42 0	...	...	...	...	...	...
	Raipur . . .	28 8	28 0	32 0	...	...	...	35 0	35 0	34 0	44 0	44 0	47 0	...	...	...	...	...	...
	Sambalpur . . .	21 0	22 12	27 0	...	...	...	48 0	54 0	68 0	68 0	84 0	81 0	...	...	...	...	...	...
	Bilāspur . . .	45 0	49 0	81 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
BRITISH BURMA.	Arakan Division.	...	...	...	...	...	...	14 0	14 0	15 0	17 0	17 0	17 0	...	...	...	...	...	...
	Akyab . . .	6 6	6 10	6 6	...	...	...	9 0	9 0	9 0	10 0	10 0	10 0	...	...	...	...	...	...
	Northern Arakan .	...	...	...	...	...	...	18 0	18 0	17 8	19 8	19 8	19 0	...	...	...	...	...	...
	Kyaukpada . . .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Sandoway . . .	No return received	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Pegu Division.	...	...	...	...	...	...	12 9	12 9	13 2	13 2	13 2	16 4	...	...	...	...	...	...
	Rangoon town and Han- thawaddy . . .	15 5	15 5	16 4	...	...	...	10 13	10 13	13 4	14 4	14 4	15 14	...	...	...	...	...	...
	Tharrawaddy . .	...	...	...	...	...	...	13 7	12 12	13 7	17 2	17 2	17 2	...	...	...	...	...	...
	Prome . . .	10 6	13 13	12 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Irrawaddy Division.	...	...	...	...	...	...	14 5	14 5	14 5	19 8	19 8	19 9	...	...	...	...	...	...
	Henzada . . .	...	...	...	...	...	...	15 15	17 3	...	18 1	18 14	...	...	...	...	...	...	...
	Bassein . . .	...	...	...	...	...	...	11 9	10 12	12 9	17 7	14 11	21 0	...	...	...	...	...	...
	Thonegwa . . .	...	...	...	...	...	...	10 3	10 3	10 3	13 13	13 13	13 13	...	...	...	...	...	...
	Thayetnyo . . .	10 15	10 1	12 8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tenasserim Division.	...	...	...	...	...	...	12 2	12 10	11 8	15 5	20 4	14 15	...	...	...	...	...	...
	Moulmein town and Amherst . . .	12 2	10 0	10 0	...	...	...	13 12	13 12	12 6	22 14	22 14	17 5	...	...	...	...	...	...
	Tavoy . . .	...	...	...	...	...	...	17 5	17 5	16 4	21 12	21 12	21 12	...	...	...	...	...	...
	Mergui . . .	...	...	...	...	...	...	16 0	18 5	21 2	18 5	21 5	21 5	...	...	...	...	...	...
	Toungoo . . .	...	...	...	...	...	...	12 7	12 7	14 8	13 13	13 13	19 3	...	...	...	...	...	...
	Shwaygyin . . .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Salween . . .	No return received	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
HYDERABAD AS- SIGNED DISTRICTS.	Secunderabad . .	17 12	17 12	15 15	...	...	...	7 14	7 14	7 2	9 13	9 13	9 13	25 1425	1425	14	...	...	31
	Bolarum . . .	19 7	19 7	11 8	...	...	...	7 6	7 6	8 11	9 6	9 8	10 7	29 929	920	4	...	...	...
	Chudderghat . .	13 8	13 8	11 8	...	...	...	7 0	7 0	7 0	9 0	9 8	9 12	26 027	027	033	033	034	...
	Amraoti . . .	16 0	17 0	18 0	11 0	11 0	9 8	8 0	8 0	7 0	10 0	10 0	10 0	26 026	046	019	019	024	...
	Akola . . .	16 0	16 0	16 0	...	...	...	8 0	8 0	8 0	12 0	10 0	10 0	28 030	031	025	025	026	...
	Ellichpur . . .	16 0	16 0	17 0	14 0	12 0	12 0	10 0	10 0	6 0	12 0	12 0	8 0	32 032	054	028	028	040	...
	Buldana . . .	18 0	17 0	21 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Wūn . . .	18 0	13 8	17 0	...	...	...	9 0	7 0	7 0	12 8	10 8	10 0	31 828	036	0	...	...	...
	Bāsim . . .	21 0	21 0	20 0	...	...	...	5 4	5 4	5 0	13 0	13 0	13 0	36 032	048	0	...	...	...

(a) Barley, bajra, and jowar falling.

(b) Barley falling.

(c) Bajra and jowar falling.



INDIA FOR THE 1st HALF OF OCTOBER 1882—continued.

SEERS OF 80 TOLAHS.

Lesser Millets, Ragi, &c. (Kavaru, Veragu, Sawee, Cheenu, Coraioo, Murnwa, Nugeel), <i>Pennisetum glaucum</i> , &c.										Gram.						Firewood.						Salt.												DISTRICTS.												PROVINCES.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
Present fortnight.		Past fortnight.		Corresponding fortnight of 1881.		Present fortnight.		Past fortnight.		Corresponding fortnight of 1881.		Present fortnight.		Past fortnight.		Corresponding fortnight of 1881.		Present fortnight.		Past fortnight.		Corresponding fortnight of 1881.		Present fortnight.		Past fortnight.		Corresponding fortnight of 1881.		Present fortnight.		Past fortnight.		Corresponding fortnight of 1881.		Present fortnight.		Past fortnight.		Corresponding fortnight of 1881.		Present fortnight.		Past fortnight.			Corresponding fortnight of 1881.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.		Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.

\* No wholesale salt sold.

(d) Bajra rising.

(e) Jowar falling.

(f) Jowar and firewood falling.

(g) Rs. 40 per 100 maunds.

C

## PRICES CURRENT OF FOOD-GRAINS THROUGHOUT

QUANTITIES PER RUPEE

PROVINCES.	DISTRICTS.	Wheat.			Barley.			Rice (best sort).			Rice (common).			Great Millet (Cholum, Jowar), Holcus Sorghum.			Bulrush Millet (Camboo, Bajra), Pennisetum Spicatum.		
		Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.	Present fortnight.	Past fortnight.	Corresponding fortnight of 1881.
		S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.
MYSORE.	Bangalore . . . . .	11 7	11 2	12 2	12 11	12 0	13 3	10 1	9 11	11 0	11 3	11 2	11 15	32 1	30 15	32 6	...	...	...
	Kolar . . . . .	...	...	...	11 2	10 3	12 0	13 10	13 15	11 13	14 14	14 14	14 1	...	...	...	...	...	...
	Tumkur . . . . .	14 0	14 0	14 0	13 0	13 0	14 0	12 8	12 0	12 0	13 8	13 0	13 8	...	...	...	...	...	...
	Mysore . . . . .	11 4	11 4	10 8	...	...	11 0	11 0	11 0	10 0	12 0	12 0	10 8	25 0	25 0	25 0	...	...	...
	Hassan . . . . .	12 0	12 0	11 0	12 0	12 8	11 8	12 0	12 0	11 0	13 0	12 8	12 0	...	...	...	...	...	...
	Shimoga . . . . .	13 10	13 10	12 11	16 13	14 11	13 11	11 9	11 9	10 8	13 10	13 10	13 10	33 10	31 8	31 0	...	...	...
	Kadur . . . . .	15 0	15 0	9 0	14 0	14 0	12 0	11 0	11 0	12 0	14 0	14 0	15 0	...	...	...	...	...	...
	Chitaldroog . . . . .	16 0	14 0	14 0	18 0	16 0	16 0	12 0	11 0	11 0	13 0	13 0	12 0	48 0	40 0	40 0	28 0	28 0	28 0
COORG.	Coorg . . . . .	9 3	9 0	7 10	8 2	8 9	8 13	10 2	10 0	10 14	14 0	13 8	15 4	...	...	...	...	...	...
	Jeypore . . . . .	17 0	17 0	16 0	24 0	24 0	23 0	6 0	6 0	6 0	9 0	9 0	9 8	20 0	20 0	24 0	21 0	21 0	21 0
	Kishengurh . . . . .	17 8	17 8	17 8	26 0	26 0	27 0	9 0	9 0	8 8	10 0	11 0	9 0	26 0	22 8	26 8	21 0	21 0	21 0
	Kerrowlee . . . . .	18 8	18 0	16 0	27 10	25 0	20 8	13 0	13 0	12 8	14 4	14 0	13 8	26 12	25 0	19 0	26 4	25 0	17 8
	Ulwur . . . . .	20 11	19 12	18 2	31 7	28 12	24 0	9 0	9 0	8 0	12 8	12 8	12 4	27 0	25 9	22 12	27 10	24 14	20 2
	Bhurlpore (City) . . . . .	19 0	19 0	17 8	28 0	28 0	21 8	6 8	6 8	6 8	11 0	11 0	7 0	22 8	22 8	21 0	17 8	17 8	17 8
	Ajmere . . . . .	16 8	16 8	17 0	24 0	24 0	26 0	5 0	5 0	5 0	8 0	8 0	8 0	22 0	20 0	24 0	19 0	18 0	22 0
	Deoli Cantonment . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
RAJPOOTANA.	Erinpura . . . . .	No return received			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Sirohee . . . . .				...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Abu . . . . .				...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Anadra . . . . .				...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hilly Tracts of Meywar . . . . .	22 0	22 0	24 0	30 0	28 0	35 0	...	...	...	18 0	16 0	17 0	...	...	...	...	...	...
	Meywar (Oodeypore) . . . . .	14 7½	14 7½	16 6½	20 5	19 8½	21 14	10 2½	10 2½	7 13	...	...	...	...	...	...	...	...	...
	Banswara (Meywar Agency) . . . . .	No return received			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Partabgarh ( " ) . . . . .				...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CENTRAL INDIA.	Marwar (Jodhpore) . . . . .	No return received			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bikaner . . . . .				...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Boondee . . . . .	17 0	17 0	21 0	27 0	27 0	30 0	10 0	10 0	8 0	10 10	10 8	9 0	28 0	30 0	30 0	...	...	...
	Kotah . . . . .	18 4	18 0	23 8	14 0	16 0	31 8	10 0	10 0	8 0	13 4	13 0	10 8	25 0	23 8	37 0	15 0	15 0	17 8
	Tonk . . . . .	14 9	14 4	18 4	22 6	22 4	21 7	7 0	7 0	7 8	10 0	9 0	9 6	24 7	24 4	23 6	21 4	21 4	18 3
	Jhalawar . . . . .	14 2½	14 2½	21 4	15 15	15 15	27 14	...	...	...	10 2	10 2	8 13½	19 8	18 12	28 4	17 15	15 13	18 3
	Shahpore . . . . .	16 14	16 1	20 8	21 12	20 3	23 12	11 12	10 5	10 0	14 8	14 2	15 0	18 6	17 9	27 0	18 4	16 12	20 0
	Dholpur . . . . .	18 11	18 11	16 13	28 11	28 1	20 4	10 2	10 2	8 1	12 6	12 6	11 14	24 6	25 8	19 11	28 2	27 9	19 11
CENTRAL INDIA.	Indore . . . . .	16 13	16 0	19 10	...	...	...	10 0	8 9	8 0	12 0	10 0	8 10	28 3	24 0	40 0	22 14	24 0	32 4
	Gwalior . . . . .	17 7	17 2	15 14	20 9	20 9	18 4	7 13	7 13	6 14	10 1	10 1	10 5	23 5	22 7	18 12	22 7	21 11	17 4
	Gooma . . . . .	21 0	20 12	27 0	20 0	19 0	21 0	9 0	9 0	9 8	9 8	10 0	10 0	26 0	25 0	38 0	16 8	16 0	21 4
	Baghelkhand (Sutna) . . . . .	20 5	20 15	20 0	35 0	35 0	30 0	8 0	8 7	7 0	21 0	18 15	21 0	32 8	35 12	28 0	29 14	27 12	18 4

DEPARTMENT OF FINANCE AND COMMERCE,  
(Statistical Branch.)



INDIA FOR THE 1st HALF OF OCTOBER 1882—concluded.

SEERS OF 80 TOLAHS.

SEERS OF 80 TOLAHS.																	PROVINCES.								
Lesser Millets, Ragi, &c. (Kavaru, Veragu, Sawee, Cheena, Coraloo, Marhwa, Nugee), <i>Panicum Miliaceum</i> , &c.									Gram.			Firewood.			Salt.										
Present fortnight.			Past fortnight.			Corresponding fortnight of 1881.			Present fortnight.			Past fortnight.			Corresponding fortnight of 1881.			Wholesale.			Retail.			DISTRICTS.	
S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.		S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.		
0 29 9	27 12	33 3	30 13	35 14	96 0	96 0	84 0	13 4	13 4	10 8	13 0	13 0	10 0†	10 0†	Bangalore	MYSORE.									
0 32 2	34 1	36 8	34 3	38 12	172 6	172 6	172 6	13 8	13 8	11 1	13 3	13 3	11 1†	11 1†	Kolar										
0 33 0	36 0	41 0	39 0	45 0	340 0	340 0	340 0	12 8	12 0	9 8	12 0	11 8	9 0†	9 0†	Tankur										
0 23 0	22 0	30 8	30 0	33 5	78 0	78 0	84 0	8 4	8 4	7 4	8 0	8 0	7 2†	7 2†	Mysore										
0 28 4	25 0	32 0	33 0	32 0	500 0	500 0	600 0	...	...	...	9 0	9 0	7 8†	7 8†	Hassan										
2 32 0	35 8	31 8	31 8	37 3	480 0	480 0	480 0	11 0	11 0	...	10 8	10 8	8 15†	8 15†	Shimoga										
0 25 0	28 0	23 0	23 0	28 0	64 0	64 0	64 0	...	...	...	11 0	11 0	9 0†	9 0†	Kadur										
2 10 40	45 5	32 0	30 0	32 0	100 0	100 0	100 0	8 0	10 0	16 0	8 0	10 0	16 0†	16 0†	Chitaldroog										
0 4 20	4 22	14 22	12 22	7 24	13 110	0 110	0 110	8 7	8 9	...	8 7	8 0	8 3	8 3	Coorg	COORG.									
...	...	...	21 8	21 0	19 0	...	...	...	14 4	14 4	...	14 0	14 0	12 0	Jeypore	RAJPUTANA.									
...	...	...	21 8	21 0	26 8	...	...	...	...	...	...	16 0	16 0	12 8	Kishengurh										
...	...	...	27 8	25 0	17 8	...	...	...	14 1	14 1	...	14 0	14 0	10 0	Kerrowlee										
...	...	...	27 6	25 10	18 12	...	...	...	15 13	15 13	...	15 6	15 6	12 8	Ulwur										
...	...	...	24 8	24 8	19 0	...	...	...	12 5	12 5	...	11 13	11 13	11 8	Bhurlpore (City)										
...	...	...	23 0	22 8	23 0	70 0	70 0	60 0	...	...	...	15 0	15 0	11 0	Ajmere										
...	...	...	21 11	21 10	23 10	...	...	...	13 8	...	...	13 4	...	...	Deoli Cantonment										
...	...	...	...	...	...	...	...	...	Rs. A. P.	Rs. A. P.	Rs. A. P.	...	...	...	Erinpora										
...	...	...	...	...	...	...	...	...	...	...	No return received	...	...	...	Sirohee										
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Abu										
...	...	...	24 0	24 0	32 0	*	*	*	...	...	...	9 0	10 0	8 8	Anadra	CENTRAL INDIA.									
...	...	...	16 0‡	16 0‡	16 4‡	200 0	200 0	200 0	S. Ch. 9 15‡	S. Ch. 9 15‡	S. Ch. 9 15‡	9 12‡	9 12‡	9 6	Hilly Tracts of Meywar										
...	...	...	...	...	...	...	...	...	...	...	No return received	...	...	...	Meywar (Oodeypore)										
...	...	...	...	...	...	...	...	...	Rs. A. P.	Rs. A. P.	Rs. A. P.	...	...	...	Banswara (Meywar Agency)										
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Partabgarh ( " )										
...	...	...	...	...	...	...	...	...	...	...	No return received	...	...	...	Marwar (Jodhpore)										
...	...	...	28 0	27 0	23 8	160 0	160 0	160 0	S. Ch. 12 8	S. Ch. 12 8	S. Ch. 9 8	12 4	12 0	...	Bikaner										
...	...	...	27 8	26 8	26 8	240 0	240 0	240 0	12 12	12 8	...	12 4	11 12	9 4	Boondee										
...	...	...	22 2	21 12	19 5	160 0	160 0	100 0	12 6	12 4	10 8	11 12	11 8	...	Kotah										
...	...	...	20 8	17 15	22 14	...	...	...	10 14	10 14	...	10 10	10 10	7 1‡	Tonk										
...	...	...	21 0	19 14	21 0	120 0	160 0	160 0	13 14	13 4	11 4	13 10	13 0	...	Jhallawar										
...	...	...	27 9	27 3	18 14	...	...	...	13 3	13 3	10 11	12 6	12 6	10 1	Shahpoora										
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Dholpur										
...	...	...	17 12	18 13	24 0	100 0	100 0	100 0	12 0	12 5	...	...	...	5 6	Indore	CENTRAL INDIA.									
...	...	...	24 10	24 3	15 10	109 8	109 8	100 6	...	...	...	11 14	11 14	10 1	Gwalior										
...	...	...	25 0	25 4	34 0	200 0	200 0	200 0	12 10	11 8	...	12 0	11 0	9 8	Goona										
...	...	...	30 14	30 0	26 0	160 0	160 0	160 0	12 8	12 2	...	11 12	11 10	10 8	Baghelkhand (Sutna)										

\* Eight pies per bundle.

† Sea Salt.

‡ Earth Salt.

D. M. BARBOUR,  
Secretary to the Government of India.

GOVERNMENT OF INDIA.  
PUBLIC WORKS DEPARTMENT.  
RAILWAY TRAFFIC.

No. XXXIX of 1882.

APPROXIMATE STATEMENT OF GROSS RECEIPTS AND EXPENSES OF INDIAN RAILWAYS.

Latest return received.	Railways.	Total length open.	RECEIPTS FOR WEEK ENDING 1ST OCTOBER 1881.		Total length open.	RECEIPTS FOR WEEK ENDING 30TH SEPTEMBER 1882.		TOTAL RECEIPTS FROM 1ST APRIL TO 1ST OCTOBER 1881.		TOTAL RECEIPTS FROM 1ST APRIL TO 30TH SEPTEMBER 1882.		Total Increase in 1882-83.	
			Total.	Per mile open.		Total.	Per mile open.	Total.	Per mile open per week.	Total.	Per mile open per week.		
			R	R		R	R	R	R	R	R	R	R
30th Sep. 1882	<i>Guaranteed.</i> Eastern Bengal	172	1,80,771	1,051	172	2,00,105	1,163	26,06,127	573	26,66,710	593	60,583	...
30th ditto	Oudh and Rohilkhand	547	1,03,125	189	547	74,806	137	24,06,591	167	24,44,851	171	38,260	...
30th ditto	Sind, Punjab & Delhi	676	2,00,665	297	676	1,80,395	267	43,42,546	244	46,22,380	261	2,79,834	...
30th ditto	Madras	858	1,63,334	190	861	1,45,765	169	32,23,611	143	35,64,386	158	3,40,735	...
7th Oct. 1882	South Indian	655	77,010	118	655	75,250	115	19,52,417	113	19,56,470	114	4,053	...
30th Sep. 1882	Great Indian Peninsula	1,439	4,34,074	302	1,450	4,18,867	289	1,54,45,494	407	1,56,82,665	417	2,37,171	...
30th ditto	Bombay, Baroda and Central India	444	1,31,994	297	461	1,22,192	265	46,90,882	402	48,47,309	402	1,56,427	...
	<b>TOTAL</b>	<b>4,791</b>	<b>12,90,973</b>	<b>269</b>	<b>4,822</b>	<b>12,17,380</b>	<b>252</b>	<b>3,46,67,708</b>	<b>274</b>	<b>3,57,84,771</b>	<b>284</b>	<b>11,17,063</b>	...
30th Sep. 1882	<i>State.</i> East Indian	1,504	11,34,746	754	1,507	7,86,221	522	2,14,95,291	543	2,14,50,224	543	...	45,067
30th ditto	Calcutta and South-Eastern	28	2,640	94	33	7,723	234	75,498	102	98,703	121	23,205	...
30th ditto	Nalhati	27	1,627	60	27	1,376	51	31,966	45	33,969	48	2,003	...
30th ditto	Northern Bengal	233	50,361	216	233	46,990	202	8,26,115	136	9,50,565	156	1,24,450	...
30th ditto	Tirhoot	75	11,355	151	75	10,720	143	2,79,458	134	3,18,234	150	38,776	...
30th ditto	Patna-Gya	57	10,360	182	57	17,425	306	2,52,679	168	2,30,233	154	...	22,446
7th Oct. 1882	Muttra-Hathras	29	2,204	76	29	2,960	102	70,344	92	60,066	79	...	10,378
7th ditto	Cawnpore-Furrakhabad	86	6,776	79	87	6,132	70	1,36,391	60	1,66,719	73	30,328	...
30th Sep. 1882	Dildarnagar-Ghazipur.	12	893	74	12	641	53	19,782	62	21,759	69	1,977	...
30th ditto	Rajputana-Malwa	1,016	1,83,250	180	1,117	1,44,759	129	40,70,137	152	49,79,998	170	9,09,861	...
7th Oct. 1882	Wardha Coal	45	7,149	159	45	13,561	301	2,42,853	205	2,58,846	220	15,993	...
7th ditto	Nagpur & Chhattisgarh	53	3,774	71	98	5,199	53	1,38,686	90	2,66,036	104	1,27,350	...
30th Sep. 1882	Rangoon and Irrawaddy Valley	161	22,298	138	161	18,007	112	6,65,119	157	6,65,935	158	816	...
30th ditto	Sindia	75	6,424	86	75	5,166	69	1,42,573	72	1,51,786	77	9,213	...
30th ditto	Punjab Northern	363	39,535	109	409	49,371	121	14,05,206	149	14,14,137	134	8,931	...
30th ditto	Indus Valley and Kandahar	660	1,09,717	166	660	78,130	118	23,33,507	134	21,18,920	123	...	2,14,587
30th ditto	Muttra-Achnera	...	...	...	23	1,292	56	...	...	33,802	56	33,802	...
	<b>TOTAL</b>	<b>2,920</b>	<b>4,58,363</b>	<b>157</b>	<b>3,141</b>	<b>4,09,452</b>	<b>130</b>	<b>1,06,90,314</b>	<b>139</b>	<b>1,17,69,708</b>	<b>143</b>	<b>10,79,394</b>	...
7th Oct. 1882	<i>Native States.</i> Bhavnagar-Gondal	193	5,448	28	194	12,965	67	3,33,998	81	4,50,250	88	1,16,252	...
7th ditto	Nizam's	121	11,842	98	121	18,925	156	3,98,104	125	4,29,258	135	31,154	...
23rd Sep. 1882	Mysore	58	4,292	74	...	...	...	(b) 67,126	46	(c) 1,34,265	62	67,139	...
	<b>TOTAL</b>	<b>372</b>	<b>21,582</b>	<b>58</b>	<b>315</b>	<b>31,890</b>	<b>101</b>	<b>7,99,228</b>	<b>90</b>	<b>10,13,773</b>	<b>95</b>	<b>2,14,545</b>	...
	<b>GRAND TOTAL</b>	<b>9,587</b>	<b>29,05,664</b>	<b>303</b>	<b>9,785</b>	<b>24,44,943</b>	<b>250</b>	<b>6,76,52,541</b>	<b>269</b>	<b>7,00,18,476</b>	<b>271</b>	<b>23,65,935</b>	...
	<b>GROSS ESTIMATED EXPENSES</b>	...	...	...	...	...	...	<b>3,35,63,195</b>	<b>133</b>	<b>3,41,81,404</b>	<b>132</b>	...	...
	<b>NET RECEIPTS</b>	...	...	...	...	...	...	<b>3,40,89,346</b>	<b>136</b>	<b>3,58,37,072</b>	<b>139</b>	<b>17,47,726</b>	...

(a) Return not received.

(b) Total receipts from 1st April to 24th September 1881.

(c) Total receipts from 1st April to 23rd September 1882.

FRED. FIREBRACE, Major, R.E.,  
Under Secretary.

SIMLA,  
The 30th October 1882.



No. XL of 1882.

## APPROXIMATE STATEMENT OF GROSS RECEIPTS AND EXPENSES OF INDIAN RAILWAYS.

EXPENSES OF INDIAN RAILWAYS.													
Latest return received.	Railways.	Total length open.	RECEIPTS FOR WEEK ENDING 8TH OCTOBER 1881.		Total length open.	RECEIPTS FOR WEEK ENDING 7TH OCTOBER 1882.		TOTAL RECEIPTS FROM 1ST APRIL TO 8TH OCTOBER 1881.		TOTAL RECEIPTS FROM 1ST APRIL TO 7TH OCTOBER 1882.		Total Increase in 1882-83.	Total Decrease in 1882-83.
			Total.	Per mile open.		Total.	Per mile open.	Total.	Per mile open per week.	Total.	Per mile open per week.		
<i>Guaranteed.</i>													
7th Oct 1882	Eastern Bengal . . .	172	R 1,60,819	R 935	172	R 2,02,124	R 1,175	R 27,66,946	R 586	R 28,68,834	R 614	R 1,01,888	R . . .
ditto	Oudh and Rohilkhand . . .	547	69,671	127	547	66,811	122	24,76,263	166	25,11,662	169	35,399	...
ditto	Sind, Punjab, and Delhi . . .	676	2,20,031	325	676	1,84,748	273	45,62,578	247	48,07,128	262	2,44,550	...
7th ditto	Madras . . .	858	1,17,394	137	861	1,15,188	134	33,41,045	142	36,79,574	159	3,38,529	...
7th ditto	South Indian . . .	655	67,591	103	655	64,749	99	20,20,007	113	20,22,171	114	2,164	...
7th ditto	Great Indian Peninsula . . .	1,439	4,05,228	282	1,458	4,39,700	302	1,58,50,723	403	1,61,22,365	409	2,71,642	...
7th ditto	Bombay, Baroda, and Central India . . .	444	1,42,989	322	461	1,35,125	293	48,33,872	399	50,60,786	404	2,26,914	...
	TOTAL . . .	4,791	11,83,723	247	4,830	12,08,445	250	3,58,51,434	274	3,70,72,520	283	12,21,086	...
<i>State.</i>													
7th Oct. 1882	East Indian . . .	1,504	6,50,526	433	1,507	7,59,524	504	2,21,45,818	539	2,22,09,748	543	63,930	...
7th ditto	Calcutta and South-Eastern . . .	28	1,979	71	33	2,870	87	77,477	101	1,01,573	110	24,096	...
14th ditto	Nalhati . . .	27	741	27	27	1,473	55	32,707	44	35,442	48	2,735	...
7th ditto	Northern Bengal. . .	233	34,268	147	230	52,950	230	8,60,383	137	10,03,363	159	1,42,980	...
14th ditto	Tirhoot . . .	75	7,481	99	75	10,172	136	2,86,939	131	3,28,406	149	41,437	...
14th ditto	Patna-Gya . . .	57	7,390	130	57	17,044	299	2,60,069	167	2,47,277	160	...	12,792
14th ditto	Muttra-Hathras . . .	29	1,821	63	29	2,231	77	72,165	91	62,297	79	...	9,868
14th ditto	Cawnpore-Furrakhabad . . .	86	5,684	66	87	4,683	54	1,42,076	60	1,71,402	72	29,326	...
7th ditto	Dildarnagar-Ghazipur . . .	12	473	39	12	550	46	20,254	62	22,309	68	2,055	...
7th ditto	Rajputana-Malwa . . .	1,016	1,92,788	190	1,117	1,49,075	133	42,62,927	153	51,29,073	169	8,66,146	...
7th ditto	Wardha Coal . . .	45	5,726	127	45	9,631	214	2,48,580	202	2,68,575	220	19,995	...
7th ditto	Nagpur and Chhattisgarh . . .	53	6,139	116	98	4,436	45	1,44,824	92	2,70,574	102	1,25,750	...
7th ditto	Rangoon and Irrawaddy Valley . . .	161	20,816	129	161	21,458	133	6,85,935	156	6,89,855	158	3,920	...
14th ditto	Sindia . . .	75	6,226	83	75	4,655	62	1,48,798	72	1,56,441	76	7,643	...
7th ditto	Punjab Northern . . .	363	55,527	153	409	54,194	133	14,60,732	147	14,63,331	133	2,599	...
7th ditto	Indus Valley and Kandahar . . .	660	1,37,123	208	660	81,929	126	24,70,630	137	22,00,849	123	...	2,69,781
7th ditto	Muttra-Achnera . . .	...	...	...	23	1,127	49	...	...	34,929	55	34,929	...
7th ditto	Kaunia Dharla Tramway . . .	21	987	47	32	1,890	59	(e) 14,177	52	40,474	46	26,297	...
	TOTAL . . .	2,941	4,85,169	165	3,160	4,20,368	133	1,11,88,673	139	1,22,26,170	142	10,37,497	...
<i>Native States.</i>													
7th Oct. 1882	Bhavnagar-Gondal . . .	192	11,533	60	193	11,244	58	3,45,531	79	4,61,773	88	1,16,242	...
7th ditto	Nizam's . . .	121	11,510	95	121	20,247	167	4,09,614	124	4,51,120	137	41,506	...
23rd Sep. 1882	Mysore . . .	58	3,347	57	...	(a) ...	...	(b) 67,126	46	(c) 1,29,069	57	61,943	...
7th Oct. 1882	Jodhpur . . .	...	...	...	19	375	46	...	...	(d) 8,451	29	8,451	...
	TOTAL . . .	371	26,390	71	333	32,366	97	8,22,271	89	10,50,413	92	2,28,142	...
	GRAND TOTAL . . .	9,607	23,45,808	244	9,830	24,20,703	246	7,00,08,196	267	7,25,58,851	269	25,50,655	...
	GROSS ESTIMATED EXPENSES . . .	...	...	...	...	...	...	3,48,11,692	133	3,54,51,591	132	...	...
	NET RECEIPTS . . .	...	...	...	...	...	...	3,51,96,504	134	3,71,07,260	137	19,10,756	...

(a) Return not received.  
 (b) Total receipts from 1st April to 24th September 1881.  
 (c) Total receipts from 1st April to 23rd September 1882.

(d) Total receipts from 24th June to 7th October 1882.  
 (e) Total receipts from 9th July to 8th October 1881.

SIMLA,  
 The 6th November 1882.

FRED. FIREBRACE, Major, R.E.,  
 Under-Secretary.

D

GOVERNMENT OF INDIA.  
PUBLIC WORKS DEPARTMENT.  
IRRIGATION BRANCH.

IRRIGATION OPERATIONS IN BENGAL FOR 1882-83.

*Areas leased for irrigation up to end of August 1882.*

Circle.	District.	Canal.	SUPPLY OF WATER IN THE CANALS.				KHARIF.				RABI.				SUGARCANE.		GRAND TOTAL.				RAINFALL.		REMARKS.	
			Estimated full discharge in cubic feet per second.	Average full discharge in cubic feet per second.	Estimated full discharge in cubic feet per second.	Estimated full discharge in cubic feet per second.	FIVE-YEAR LEASES.		THREE-YEAR LEASES.		ANNUAL LEASES.		THREE-YEAR LEASES.		ANNUAL LEASES.		Leased up to end of August 1882.	Leased up to end of August 1882.	Leased up to end of August 1882.	Leased up to end of August 1882.	Leased up to end of August 1882.	Leased up to end of August 1882.		Leased up to end of August 1882.
							Leased in August 1882.	Leased up to end of August 1882.	Leased in August 1882.	Leased up to end of August 1882.	Leased in August 1882.	Leased up to end of August 1882.	Leased in August 1882.	Leased up to end of August 1882.	Leased in August 1882.	Leased up to end of August 1882.								
Orissa.	Cuttack.	Kendrapara.	1,269	780.10	40,081	13,667	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Patamondue.	1,042	386.20	11,272	796	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		High Level, Section I.	675	289.45	13,857	636	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Taldanda.	1,390	578.00	10,076	932	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sone.	Shahabad.	Malabong.	660	383.00	25,269	1,176	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		High Level, Section II.	727.16	0.00	204	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Balasore.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Total of the month.	...	...	100,489	23,334	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sone.	Shahabad.	Total of the corresponding month of previous year.	...	...	100,573	11,129	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Midnapore.	875	1,000	80,987	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Howrah.	300	270	11,940	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Total of the month.	...	...	92,927	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sone.	Shahabad.	Total of the corresponding month of previous year.	...	...	237	103,757	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Midnapore.	4,942	2,229	1,948	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Howrah.	1,228	559	6,122	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Total of the month.	...	...	8,060	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sone.	Shahabad.	Total of the corresponding month of previous year.	...	...	2,064	10,423	43,416	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Midnapore.	1,406	883	88	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Howrah.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Total of the month.	...	...	86,193	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sone.	Shahabad.	Total of the corresponding month of previous year.	...	...	3,298	21,228	26,620	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Midnapore.	2,778	28,789	32,909	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Howrah.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Total of the month.	...	...	59,549	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sone.	Shahabad.	Total of the corresponding month of previous year.	...	...	23,334	18,220	6,178	32,790	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Midnapore.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Howrah.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Total of the month.	...	...	17	272	18,220	6,178	32,790	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sone.	Shahabad.	Total of the corresponding month of previous year.	...	...	3,298	21,705	331,010	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Midnapore.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Howrah.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Total of the month.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

G. F. ES NEILL, Major, M.S.C.,

\* This return includes all the rabi area for 1882-83. The decrease, as compared with last year, is due to many channels on the Khe drapra having been entirely closed for the speedier completion of drainage cuts. The demand for canal water for Kharif lands was continuous throughout the month.

CALCUTTA,

The 5th October 1882.

G. F. E. S. NEILL, Major, M.S.C.,  
Asst. Secy. to the Govt. of Bengal  
in the P. W. Dept.



GOVERNMENT OF INDIA.  
HOME DEPARTMENT.

LOCAL SELF-GOVERNMENT IN MADRAS.

No. 1532, dated Ootacamund, the 20th October 1882.

From—C. G. Master, Esq., Chief Secretary to the Government of Madras,  
To—The Secretary to the Government of India, Home Department.

With reference to your letter, dated 31st May 1882, No. 830, I am directed to forward, for submission to His Excellency the Viceroy and Governor General in Council, the accompanying copy of a report by the Committee appointed in this Presidency to consider the question of local self-government, containing their preliminary observations on the subject, together with the remarks passed by this Government thereon.

*Extract from the Proceedings of the Government of Madras, Financial Department, No. 1531, dated the 20th October 1882.*

Read again the following paper :—

G. O. No. 597, dated 29th June 1882.

Read also the following paper :—

From R. S. Benson, Esq., Secretary to the Committee on Local Self-government, to the Chief Secretary to the Government of Madras, No. 193, dated Ootacamund, the 17th October 1882.

Order thereon by the Government of Madras.

The paper recorded above contains the preliminary observations of the Committee (consisting partly of Europeans and partly of Natives) to which was entrusted the duty of reporting upon the views and instructions of the Government of India in their bearing on the question of local self-government in the Madras Presidency, after full communication alike with the officers of this Government and with the most authoritative exponents of indigenous South Indian opinion.

2. It is gathered from the Resolutions of the Government of India that the points as to which the Governor General in Council is chiefly anxious are—

- (1) that in the larger towns and more advanced rural districts election should be the rule, not the exception ;
- (2) that in such towns and districts the Chairman should usually not be an official.

3. The sketch which the Committee have submitted indicates the mode in which the elective franchise has been extended to the larger towns\* in this Presidency; and although the privilege may have been sometimes abused and sometimes neglected, there is no reason on the whole to complain of the working of representative institutions in the rural municipalities.

\* Trichinopoly.  
Madura.  
Bellary.  
Tanjore.  
Salem.  
Calicut.

Negapatam.  
Kumbakonam.  
Ootacamund.  
Cuddalore.  
Tinnevely.  
Mangalore.

4. The report further shows that, though in the districts the elective system has not yet been tried, the working of the Local Fund Boards, as at present organised, has been decidedly good.

5. The Government regard with much satisfaction the very great progress that has been made in recent years, and believe that such progress would not have been so great if the maxim *festina lente* had not guided the action heretofore taken; but at the same time they are far from thinking that the hour has not come for a decided, although cautious, advance along the whole line in the direction of the further development of local liberties.

6. It would be easy to find not merely conservative, but very advanced liberal, authority for the doctrine that "if a principle, however progressive it may appear, can compromise all that has been acquired, it should not be enunciated." Nothing, however, could be further than this from the proposals now under consideration. What this Government are asked to do is only to build higher upon old lines. The Right Hon'ble the Governor in Council finds, therefore, no difficulty in agreeing to the first of the leading principles mentioned above. He is prepared to increase the number of towns in which the municipal body is elected, and to introduce election into the more advanced rural districts tentatively at first, but in the full belief that it will soon be possible to increase the number of Local Fund Boards which are not nominated, but elected.

7. As to the second leading principle, the Collector has hitherto been the President of all Municipalities and Local Fund Boards, wielding, in the former case, often a merely nominal authority; for it is clear that in most Municipal Boards the people have virtually managed their own affairs. His Excellency in Council considers that it will be perfectly safe to go beyond the suggestions on this point now submitted to him in the report read above, and to affirm the principle that in the larger towns, as well as in the more advanced rural districts, the Chairman should not usually be an official.

8. Though, however, the Collector may, in most cases, cease to be the President or even a member of the Municipalities and Local Fund Boards in his district, none the less will it be his duty to act as the adviser and guide of all these organisations, and to report for the orders of Government every case in which he thinks that the action of any of them may be likely to lead to seriously injurious effects.

9. The Government of India, as His Excellency the Governor in Council apprehends, are by no means desirous of leaving a number of bodies, many of which must in the nature of things be inexperienced, to find their own way through the pitfalls and mazes of local administration without help; but there is a wide difference between keeping people in leading strings and emancipating them from all control, the whole difference in fact which is usually found between the treatment of childhood and adolescence. Occasions may of course arise in which local circumstances or peculiar conjunctures may require a different arrangement, and the Government therefore have reserved to themselves the power of directing their representative to assume the presidency of any local organisation; but the occasions for such a step will, it is believed, be always rare; and as the practical education of the people in the management of their own local affairs will continually advance, this power may at length, it is hoped, be permitted to fall into desuetude.

10. There can be no doubt that, as the prosperity and intelligence of the country increase, demands will be made upon the administration which it will be quite impossible to supply through direct official agency; and it will be more and more necessary to relieve the highly paid and elaborately trained European Superintendents of work which can be, if not at first as well, at least very tolerably, done by less trained and often unpaid ability. His Excellency the Governor in Council finds in this consideration a strong argument in favour of the views of the Government of India, altogether apart from the duty of advancing the political education of the people,—a duty to which he is far from omitting to attach importance.

11. The Committee have noticed another principle to which the Government of India have called special attention, *viz.*, that the administrative unit of Local Government in rural districts should be smaller than it has been. The suggestion will, of course, be considered more in detail when the Committee have had time to elaborate their recommendations; but meanwhile His Excellency in Council desires to remark that he is in no way disinclined to admit the principle, regard of course being had to the nature of particular tracts of country and the diffusion of elementary education within the same.

12. In thus recording his observations on the most salient points connected with this important question for the guidance of the Committee in their further deliberations, the Right Hon'ble the Governor in Council would further remark that the powers reserved in the 17th paragraph of the Resolution\* of the Government of India are absolutely necessary to the

safety of the changes which are to be made. For a long time to come such acts as the raising of loans, the imposition of taxes in other than duly authorised form, the alienation of municipal property, or interference with any matters involving religious questions or affecting the public peace, will require to remain under the control of the executive authority. With these safeguards there is not, in His Excellency's opinion, any doubt of the success of the suggested experiments in this part of India.

13. The Committee are thanked for their most useful labors, and requested to continue them with a view to laying before Government a further exposition of their views and draft Acts practically applying them, regard being had to the principles affirmed in this order.

No. 1773, dated Simla, the 6th November 1882.

From—A. MACKENZIE, Esq., Secretary to the Government of India, Home Department,  
To—The Chief Secretary to the Government of Madras.

I am directed to acknowledge the receipt of your letter No. 1532, dated the 20th ultimo, forwarding a copy of a preliminary report by the Committee appointed under the orders of the Government of Madras to consider the question of local self-government in the Madras Presidency, together with the remarks passed by His Excellency the Governor in Council thereupon.

2. In reply, I am to convey the thanks of the Governor General in Council to the Government of Madras for the important steps which are being taken by them with a view to carrying out in the Madras Presidency the policy of the Government of India, as laid down in the Resolution of the 18th May 1882.



DESTRUCTION OF WILD ANIMALS AND VENOMOUS SNAKES IN BRITISH INDIA.

No.  $\frac{48}{1780-90}$ .

*Extract from the Proceedings of the Government of India in the Home Department (Public),—  
under date Simla, the 8th November 1882.*

Read—

Resolution of the Home Department, No. 48—1585-95, dated the 4th October 1881, reviewing the reports on the results of the measures adopted for exterminating wild animals and poisonous snakes in British India during the year 1880.

Read also the following letters from the Local Governments and Administrations submitting returns for the year 1881, and reports of special measures adopted in some cases :—

From the Government of Madras, No. 261A., dated the 4th March 1882.

From the Government of Madras, No. 757, dated the 17th July 1882.

From the Government of Bombay, No. 2279, dated the 19th June 1882.

From the Government of Bengal, No. 429, dated the 18th September 1882.

From the Government of the North-Western Provinces and Oudh, No. 1920, dated 2nd June 1882.

From the Government of the North-Western Provinces and Oudh, No. 2480, dated 22nd July 1882.

From the Government of the Punjab, No. 1727, dated the 30th August 1882.

From the Government of the Punjab, No. 1974, dated the 7th October 1882.

From the Chief Commissioner of the Central Provinces, No. 1139-65, dated the 6th April 1882.

From the Chief Commissioner, British Burma, No. 780-98, dated the 21st March 1882.

From the Chief Commissioner, Coorg, No. 1750-110, dated the 28th January 1882.

From the Chief Commissioner, Assam, No. 722, dated the 17th May 1882.

From the Resident at Hyderabad, No. 185, dated the 29th April 1882.

From the Chief Commissioner of Ajmere and Merwara, No. 127, dated the 21st February 1882.

RESOLUTION.

The statement appended to this Resolution shows in detail for each province the number of persons and cattle killed by wild animals and snakes, and the number of wild animals and snakes destroyed, with the rewards paid for their destruction during the year 1881, as compared with the previous year. The figures are summarised in the following tables :—

*Number of human beings and cattle killed.*

	PERSONS KILLED						CATTLE KILLED					
	By wild animals.		By snakes.		Total.		By wild animals.		By snakes.		Total.	
	1880.	1881.	1880.	1881.	1880.	1881.	1880.	1881.	1880.	1881.	1880.	1881.
Madras ... ..	223	238	1,182	1,064	1,405	1,302	8,667	8,668	227	270	8,894	8,938
Bombay ... ..	136	141	972	1,024	1,108	1,165	4,537	2,398	89	191	4,626	2,599
Bengal ... ..	1,295	1,397	10,064	9,208	11,359	10,635	14,567	8,423	1,248	154	15,815	8,577
North-Western Provinces and Oudh ... ..	561	470	4,723	5,010	5,284	5,480	8,140	7,971	221	317	8,361	6,288
Punjab ... ..	42	27	681	744	723	771	7,986	4,083	78	69	8,064	4,152
Central Provinces ... ..	289	248	991	985	1,280	1,233	3,711	2,929	39	26	3,750	2,955
British Burma ... ..	32	34	149	135	181	169	978	898	104	159	1,172	1,048
Coorg ... ..	<i>Nil</i>	<i>Nil</i>	3	<i>Nil</i>	3	<i>Nil</i>	219	191	<i>Nil</i>	<i>Nil</i>	219	191
Assam ... ..	234	211	211	189	445	400	3,269	2,802	57	16	3,326	2,818
Hyderabad Assigned Districts ... ..	24	18	125	197	149	215	3,569	3,013	383	836	3,943	3,849
Ajmere-Merwara ... ..	4	3	49	54	53	57	216	264	<i>Nil</i>	<i>Nil</i>	216	264
Total ... ..	2,840	2,757	19,150	18,670	21,900	21,427	55,850	41,640	2,536	2,029	58,386	43,682

*Number of wild animals and snakes destroyed and amount of rewards paid.*

	WILD ANIMALS.				SNAKES.			
	Destroyed.	Rewards.	Destroyed.	Rewards.	Destroyed.	Rewards.	Destroyed.	Rewards.
	1880.		1881.		1880.		1881.	
		Rs. A. P.		Rs. A. P.		Rs. A. P.		Rs. A. P.
Madras ...	1,284	16,579 10 0	1,420	20,251 5 0	Nil	Nil	Nil	Nil
Bombay ...	1,717	4,775 1 0	1,367	4,965 13 0	177,078	6,022 3 6	2,07,113	6,214 0 0
Bengal ...	4,783	24,841 10 6	4,213	23,316 3 0	23,201	3,733 3 6	19,282	3,430 5 0
North-Western Provinces and Oudh	2,024	7,295 4 0	3,037	8,434 14 0	1,029	10 2 0	1,142	56 5 3
Punjab ...	1,389	4,715 0 0	1,411	4,856 3 0	9,126	635 5 0	22,279	1,597 4 0
Central Provinces ...	1,408	17,897 8 0	1,351	15,842 0 0	866	336 6 0	1,493	562 8 0
British Burma ...	630	3,468 0 0	1,050	4,200 8 0	997	2 0 0	2,900	27 0 0
Coorg ...	20	140 0 0	15	215 0 0	58	Nil	16	4 0 0
Assam ...	541	7,022 10 0	1,176	7,552 2 0	202	Nil	300	34 0 0
Hyderabad Assigned Districts ...	167	1,590 0 0	216	2,150 0 0	158	23 14 0	332	45 8 0
Ajmere-Merwara ...	8	13 0 0	5	Nil	61	Nil	21	Nil
Total ...	14,886	88,327 11 6	15,279	90,850 0 0	2,12,776	11,663 2 0	2,54,968	11,900 14 3

2. The above figures show a decrease during the year under review, as compared with the previous year, both in the number of persons and of cattle killed, and, on the other hand, an increase in the number of wild animals and snakes destroyed. The total number of persons killed during the year was 21,427 against 21,990 in the year 1880. As was the case in the previous year, the mortality which occurred in Bengal and in the North-Western Provinces and Oudh, in which Provinces the deaths amounted respectively to 10,635 and 5,480, was far greater than in other Provinces. Of the total number of deaths, 18,670 resulted from snake-bite and 2,757 were caused by wild animals; the figures for the previous year being 19,150 and 2,840 respectively. The number of persons killed in Bengal (747) and in the North-Western Provinces and Oudh (208) by wild animals other than those specifically named in the returns was considerable. In future returns the animals which came under the general head "Other Animals," and which cause in all Provinces a very large proportion of the mortality, should be specified in a footnote with the number of deaths caused by each kind.

3. The total number of cattle killed decreased from 58,386 to 43,669. This result is chiefly due to the exclusion from the Bengal return of sheep and goats, of which a large number (6,463) were included in the figures for the year 1880. There has, however, been a marked decrease in the number of cattle killed by wild animals and snakes in the Bombay Presidency, the figures for the years 1880 and 1881 being 4,626 and 2,589 respectively. In the Punjab also the number of cattle killed was considerably less than in the preceding year, but in this Province, as in the case of Bengal, the decrease appears to be due to the exclusion of sheep and goats from the returns of the year 1881.

4. The number of wild animals destroyed was 15,279 against 14,886 in 1880. The number of tigers, leopards, bears and wolves destroyed was 1,557, 3,397, 991 and 4,538, respectively, as compared with 1,689, 3,047, 1,100 and 4,243 in the preceding year; and the number of human beings killed by these animals respectively amounted to 889, 239, 75 and 256 against 872, 261, 108 and 347 in the year 1880.

5. The total amount of rewards paid during the year was Rs. 1,02,811. Of this sum, Rs. 90,850 were awarded for the destruction of wild animals, the remainder, Rs. 11,961, being paid for the destruction of snakes. Of the latter amount,



Rs. 6,214 were paid in the Bombay Presidency, Rs. 3,430 in Bengal, Rs. 1,587 in the Punjab, and Rs. 562 in the Central Provinces. In the other Provinces the payments for the destruction of snakes were nominal, while in the Madras Presidency no rewards are given on this account.

6. In the review of the returns for the year 1880, a hope was expressed that endeavours would be made to induce men belonging to the shikari class to devote themselves specially to the work of destruction in districts which are more than usually infested with wild animals, and Local Governments were authorised to make special arrangements for the experimental employment of such men. From the present reports it appears that the Government of Madras has decided that the employment of a paid corps of shikaris is undesirable, as the cost of supervision would be excessive, while the employment of such a corps would discourage local shikaris. On this point the Governor General in Council desires to remark that where local shikaris exist, it is very desirable that every encouragement should be held out to them; and that in such cases it is preferable to trust to fixed, certain and prompt payments according to results as the most effective way of inducing the shikaris to devote themselves to the work. At the same time certain tracts of country exist in which the special and temporary employment of men from outside may be very useful and expedient, and the reports show that the adoption of this plan has in some cases been followed by satisfactory results. For instance in the Fatehpur District in the North-Western Provinces, the entertainment of a body of special shikaris resulted in the destruction of a considerable number of wolves with which that district was infested. In Dinagepore, in the Lower Provinces also, professional hunters were engaged during the closing month of the year for the destruction of tigers. In the Central Provinces the ravages committed by tigers in the Balaghat and Seoni Districts necessitated the offer of enhanced rewards for their destruction, and the District Officer of Seoni has endeavoured to organise a special expedition of shikaris for the purpose of hunting down the animals, and has provided the shikaris with ammunition. Licenses under the Arms Act appear to have been more freely given than hitherto to persons who require arms for protecting themselves and their cattle and crops from the attacks of wild animals, but the Governor General in Council desires to take the opportunity of expressing a hope that this matter will be carefully kept in view by Local Governments and Administrations in order that every possible facility may be offered to cultivators and others for obtaining such licenses in districts in which wild beasts are more than usually abundant.

7. As regards the destruction of venomous snakes, special measures were adopted in some Provinces, of which it appears desirable to give a brief account in case they may be considered suitable for adoption elsewhere. In Bengal a scheme has been sanctioned by the Local Government in the case of the Patna Division, under which persons destroying snakes can obtain certificates from certain selected planters vouching for the poisonous nature of the snakes destroyed. The production of such a certificate entitles the holder to secure from the local authorities the reward offered whenever he finds an opportunity of applying for it. As observed by the Government of Bengal, this concession will probably be found to add much to the convenience of persons claiming rewards, and to act as an inducement towards the destruction of poisonous snakes. The expediency of extending the scheme will be considered by the Local Government when the results of the current year's operations are known. In the North-Western Provinces and Oudh the Lieutenant-Governor and Chief Commissioner has sanctioned the entertainment tentatively in each district of those Provinces of a staff of Kanjars, or men of similar caste who trap and kill reptiles, for the systematic destruction of venomous snakes. These men will receive pay at the rate of Rs. 2 per mensem, together with an additional reward of two annas for every venomous snake in excess of 20 destroyed by each man during any month. A gang of snake-hunters is also to be employed at each tahsili, and, if the measure proves successful, it is proposed that similar gangs should be eventually appointed to each police circle or other local area. It appears to the Governor General in Council that a plan for the destruction of snakes, such as that initiated in the North-Western Provinces and Oudh, is

likely to prove far more efficacious than the mere offer of rewards, although it is true that unless such operations are confined to towns and villages and their neighbourhoods, where it is believed that the largest number of deaths occur from snake-bite, they will probably be very costly. His Honour the Lieutenant-Governor of the Punjab has issued a circular to Commissioners and Superintendents in the Punjab, drawing attention to the matter with a view to the adoption of measures for destroying snakes by a system of rewards to be granted by District Committees and Municipalities. Casts and lithographed pictures of the more common species of deadly snakes have already been supplied to the police stations in some districts, and Deputy Commissioners have been requested to suggest to Municipal and District Committees the desirability of procuring similar means of reference for the purpose of testing applications for rewards. In British Burma the Chief Commissioner, with a view to encourage village snake-hunts in the rice plains, has arranged to grant sums varying from Rs. 10 to Rs. 20, according to the number of houses, in aid of a feast or *pweh* at the end of the annual hunt to every village which successfully carries out such an undertaking.

8. On the whole, the results recorded during the year under review appear to the Government of India to be more satisfactory than those of the previous year. The Governor General in Council is glad to notice that the question of taking measures to reduce the lamentable loss of life which is at present caused by wild animals and venomous snakes is receiving the earnest consideration of Local Governments and Administrations, and His Excellency in Council will await with interest the reports showing the results of the special measures which have been adopted in some Provinces. It is clear that much still remains to be done; but if sustained efforts are made and well considered plans adopted for the extermination of wild beasts and deadly snakes, His Excellency in Council believes that the number of deaths from these causes will in course of time be materially reduced.

ORDER.—Ordered, that this Resolution, with the appended table, be forwarded to Local Governments and Administrations for information and guidance, and that it be published in the Supplement to the *Gazette of India*.



GOVERNMENT OF INDIA.  
REVENUE AND AGRICULTURAL DEPARTMENT.

REPORTS ON THE STATE OF THE SEASON AND PROSPECTS OF THE CROPS FOR  
THE WEEK ENDING THE 7th NOVEMBER 1882.

GENERAL REMARKS.—There has been light rain in the Madras Presidency, the Mysore State, and in British Burma. In Coorg heavy showers have been injurious to the rice crop coming into flower. In the Nizam's Territories, in the Central Provinces, in Bengal, and in Assam slight rain has fallen in a few districts.

Harvest operations are still in progress in parts of the Madras Presidency, Mysore, Bombay Presidency, Central Provinces, North-Western Provinces and Oudh, Central India, Rajputana, and Punjab.

Standing crops are on the whole in good condition throughout the country. More rain would, however, be beneficial in parts of the Madras Presidency, of the Deccan and Kaladgi, and in two districts in Oudh.

Sowings of *rabi* crops are still in progress in the North-Western Provinces and Oudh, in the Punjab, and in Rajputana and Central India, and have been nearly completed in Bengal, Central Provinces, Bombay Presidency, Berar, and the Nizam's Territories.

In the Bombay Presidency locusts are now leaving Násik and Ahmednagar, but are doing damage in Poona and Satara.

Presidency or Province and District.	Rainfall for week preceding.	State of agricultural prospects.
<b>Madras—(Nov. 8th)</b>		
Bellary ...	·47 (average of four stations).	Standing crops generally good; harvest dry grain, yield average.
Kurnool ...	·52 (average of four stations).	More rain wanted for dry crops; harvest early dry crops generally above, and indigo below, average; cattle-disease in parts.
Ganjam ...	2·49 (average of sixteen stations).	More rain wanted; standing crops, dry, grains and sugarcane thriving; fever, small-pox, and cattle-disease continue; cholera in one division.
Kistna ...	1·93 (average of thirteen stations).	Standing crops paddy affected by grub in two talukas, harvest dry grains, outturn below average; fever and cattle-disease prevail; water over the anicut 3 feet.
Chingleput (Madras) ...	·96 (average of eleven stations).	Standing crops good under river channels, elsewhere generally withering from want of rain; harvest paddy and dry grains, outturn below average; cattle-disease in parts.
Coimbatore ...	·68 (average of ten stations).	Standing crops good; harvest wet and dry grains, outturn average; fever, small-pox, and cattle-disease in parts; a few cases of cholera.
Tanjore ...	1·11 (average of eleven stations).	Standing crops good except in parts upland where they suffer from want of rain; harvest wet and dry grains, outturn below average.
Madura ...	·19 (average of two stations).	Standing crops fair except in one taluk; cholera in parts.
Malabar ...	·90 (average of seven stations).	Second crop progressing; small-pox and cholera slight in parts.
Travancore ...	·25	Agricultural operations progressing; fever exists. <i>General Remarks.</i> —General prospects good.
<b>Bombay—(Nov. 8th)</b>		
Kurrachee ...	No rain	River on 6th 7½ feet against 7 feet on same date last year; fever in all talukas; 1 case small-pox in Sakro taluka; wheat, red rice, and <i>bajri</i> in Kurrachee 24, 36 and 41, in Kotri 30, 32 and 50, in Mirpur Botoro 23, 48 and 48, and in Sakro 16, 36 and 48 lbs. per rupee respectively.
Hyderabad ...	.....	<i>Kharif</i> reaping nearly completed; cotton picking in progress; <i>rabi</i> sowing continues; small-pox in Hyderabad; cattle-disease in two and fever in four talukas; wheat 25, <i>bajri</i> 44, <i>juari</i> 48, red rice 32, and white rice 22 lbs. per rupee.
Ahmedabad ...	.....	Sowing of wheat and gram continues, other crops doing well; fever in Dholka, Viramgaum, Gogo and Parantej; cattle-disease continues in Sanand; wheat 29 and <i>bajri</i> 34 lbs. per rupee.
Baroda ...	.....	<i>Kharif</i> harvesting and <i>rabi</i> sowings continue; cholera re-appeared in Amreli; cattle-disease in parts of Kari division; <i>bajri</i> 33 and common rice 24½ lbs. per rupee.
Surat ...	.....	<i>Kharif</i> harvest progressing; <i>rabi</i> sowing commenced; standing crops healthy; <i>juari</i> 38½ lbs. and <i>nagli</i> 60 lbs. per rupee.
Násik ...	.....	Locusts disappearing except in Dangi villages; <i>bajri</i> nearly all reaped; much <i>rabi</i> sown and doing well, but retarded in eastern parts; health good; fever in west of Násik taluka; wheat 22, <i>juari</i> 44, <i>bajri</i> 36, and rice 26 lbs. per rupee.
Colaba (Bombay) ...	.....	Average abnormal temperature 2° cool; vapour in air in defect of normal, except on 3rd when it was in excess of normal; wind normal.

Presidency or Province and District.	Rainfall for week preceding.	State of agricultural prospects.
<b>Bombay—contd.</b>		
Poona ...	.....	Reaping of <i>kharij</i> and sowing of <i>rabi</i> crops nearly completed; locusts beginning to move off; damage considerable in western districts, slight in centre, east untouched; <i>bajri</i> 47 and <i>juari</i> 61 lbs. per rupee; in Poona <i>bajri</i> 43 and <i>juari</i> 52 lbs. per rupee.
Ahmednagar ...	.....	Rain urgently wanted; reaping of <i>bajri</i> approaching completion; sowing of <i>rabi</i> completed; locusts gradually disappearing; cholera continues in Karjat; <i>bajri</i> —maximum 66 lbs. per rupee in Jamkhed, minimum 45 lbs. per rupee in Kopergaon; <i>juari</i> —maximum 96 lbs. per rupee in Jamkhed, minimum 45 lbs. per rupee in Sangamner.
Sholapur ...	.....	Rain wanted; <i>bajri</i> 60 lbs. 22 tolas and <i>juari</i> 80 lbs. 27 tolas per rupee.
Dharwar ...	No rain	Weather cloudy; harvesting of early rice, <i>bajri</i> , and <i>juari</i> , in progress; sowing of grain, wheat, and other <i>rabi</i> crops finished in some parts and progressing in others; sugarcane damaged by too much rain; cotton and other crops good; foot-and-mouth disease among cattle in three talukas; general health good; prices as before.
Kanara ...	.....	Rice harvest completed in Karwar taluka, continues in other talukas; sugarcane and garden produce thriving; slight small-pox in Sidapur; fever in two talukas; common rice at Karwar 11 seers, in district average 13½ seers per rupee.
Rajkot ...	.....	Nights cool; general health fair; slight cholera in Nawanagar, Junagad, Gondal, and Dhrol talukas; fever in Nawanagar, Dhrol, Gondal, Mengui, Bagasra, and Vasarad; <i>bajri</i> 28 and <i>juari</i> 35 lbs. per rupee. <i>General Remarks.</i> —Harvesting <i>kharij</i> and sowing <i>rabi</i> completed in some districts, in progress in the rest; rain urgently wanted for <i>rabi</i> in parts of Deccan and in Kaladgi; locusts leaving Nasik and Ahmednagar and doing damage in Poona and Satara districts; fever and cattle-disease in some districts; slight cholera and small-pox in a few.
<b>Bengal—(Nov. 8th)</b>		
Chittagong ...	1·3	Weather cloudy with occasional rain, unfavourable to winter crops; prices steady; cattle-disease still prevails; general health good.
Dacca ...	·56	Harvesting of rice commenced; sowing of winter crops in progress.
24 Pargunnahs (Calcutta)	1·93	Prospects of late rice and sugarcane satisfactory; lands being prepared for winter crops; price of common rice stationary; general health good; isolated cases of cholera reported from some villages in Diamond Harbour sub-division.
Moorshedabad ...	·85	Prospects of crops favourable; sowing of winter crops commenced; fever prevails here and there.
Rajshahye ...	·53; Nattore, ·85	Prospects of crops favourable; fever general; cholera in Nattore sub-division.
Burdwan ...	3·28	Late rain has somewhat depressed prospect of a good <i>aman</i> crop; prospects of winter crops fair; public health pretty fair.
Rungpore ...	Nil	Weather seasonable; prospects of crops good; public health good.
Bhagalpur ...	Nil	Prospects of crops good; <i>rabi</i> sowings progressing.
Purneah ...	Nil	Prospects of crops fair; sowings of cold weather crops progressing; fever bad.
Patna ...	Nil	<i>Rabi</i> sowings going on; <i>rahar</i> , <i>juari</i> , and mustard growing splendidly; cutting of sugarcane continues; public health good.
Durbhunga ...	Nil	Rice prospects fair; <i>rabi</i> sowings progressing; prices stationary; public health middling; fever reported both from north and south.
Hazáribágh ...	Nil	Weather cloudy; cutting of upland rice going on; sowing of <i>rabi</i> crops continues; cattle-disease reported; public health good.
Cuttack ...	1·94	Late rice ripening; <i>rabi</i> crops doing well; public health good. <i>General Remarks.</i> —Rain fell in many districts during the week, it was not very considerable in any part and did little or no harm to the crops; <i>aman</i> rice and sugarcane generally doing well, but the latter crop will be short in several places owing to scanty rainfall in July and August; cultivation for <i>rabi</i> crops progressing favourably and the crops already sown are growing well; fever prevalent in several districts, particularly in Nuddea where deaths are said to be increasing; cases of cholera still reported from some districts.
<b>N. W. Provinces and Oudh—</b>		
Benares (Nov. 7th)	No rain	Weather seasonable; <i>rabi</i> sowings in progress; no sickness; prices steady.
Allahabad ( „ 8th)	No rain	<i>Rabi</i> prospects excellent; <i>kharij</i> crops being harvested; prices stationary; health good on the whole.
Gorakhpur ( „ 6th)	.....	Weather fine; <i>rabi</i> sowings in progress; late <i>kharij</i> promising; prices stationary.
Jhansi ( „ „ )	.....	<i>Rabi</i> sowings in progress; newly sown crops germinating; <i>kharij</i> harvesting continues; a fall of rain now would benefit the <i>rabi</i> crops greatly.
Agra ( „ 8th)	No rain	<i>Kharij</i> being harvested; <i>rabi</i> sowings continue; sugarcane being irrigated; fever abating; general health good; prices stationary.
Bareilly ( „ 7th)	.....	Prospects good; cholera ceased; fever still prevalent.



Presidency or Province and District.	Rainfall for week preceding.	State of agricultural prospects.
<b>N. W. Provinces and Oudh—contd.</b>		
Meerut (Nov. 7th)	No rain	Health good; <i>kharif</i> harvest nearly over, outturn good; <i>rabi</i> sowings continue; markets well supplied; wheat and oil seeds exported to Calcutta; prices stationary.
Kumaun ( " " )	No rain	Wheat mostly sown; general health good; cattle-disease continues; prices unchanged.
Lucknow ( " " )	No rain	Outturn of <i>mask</i> poor; <i>kharif</i> harvest and <i>rabi</i> sowings in full swing; rain wanted for <i>do-fusli</i> lands; cholera dying out; fever prevalent.
Partabgarh ( " " )	.....	Prices stationary; <i>moth</i> and <i>urd</i> being harvested; mornings cool; cholera continues in two tahsils; slight cattle-disease in Partabgarh tahsil.
Sitapur ( " " )	No rain	Rain is much wanted in Sidhauhi; <i>rabi</i> sowings not completed; cattle-disease decreasing; prices stationary.
Fyzabad ( " " )	No rain	<i>Rabi</i> sowings going on; weather fine; fever and cattle-disease in part of tahsil Akbarpur.
Rae Bareilly ( " " )	.....	Weather seasonable; <i>rabi</i> sowings in progress; <i>juari</i> yield poor; fever and cholera still continue; markets well supplied; prices steady.
Cawnpore ( " " )	No rain	<i>Rabi</i> sowings nearly completed; <i>kharif</i> outturn expected to be average; health good; prices nearly stationary.
Farukhabad ( " " )	No rain	<i>Rabi</i> sowings nearly completed; prices steady; fever decreasing.
<b>General Remarks.</b> —No rain; rain wanted in Lucknow and parts of Sitapur; <i>kharif</i> harvest and <i>rabi</i> sowings progressing; prices stationary; cholera continues in Rae Bareilly and Partabgarh, but is disappearing elsewhere; cattle-disease continues in four districts.		
<b>Punjab—(Nov. 7th)</b>		
Delhi ...	No rain	Health good; prices steady; average yield expected.
Hissar ...	No rain	Health good; prices stationary; harvest prospects unchanged.
Umballa ...	No rain	Health good; prices stationary; <i>rabi</i> sowings in progress.
Jullundur ...	No rain	Health good; prices stationary; average outturn of crops expected.
Amritsar ...	No rain	Health good; prices steady.
Lahore ...	No rain	Health good; prices steady; crop prospects good.
Ferozepore ...	No rain	Health good; prices steady; crop prospects good.
Sialkot ...	No rain	Health good; prices stationary; <i>rabi</i> sowings progressing.
Rawalpindi ...	No rain	Slight fever still prevails; prices steady; <i>rabi</i> sowings in progress.
Peshawar ...	No rain	Fever prevalent; prices stationary; <i>kharif</i> crops being reaped.
Mooltan ...	No rain	Fever abating; prices of food-grains steady.
Dera Ismail Khan ...	No rain	Fever prevalent; prices steady; crop prospects good.
<b>General Remarks.</b> —The health of the province generally good; slight fever still prevails in the Rawalpindi, Dera Ismail Khan, and Peshawar districts; the crop prospects are generally good.		
<b>Central Provinces—</b>		
Nagpur (Nov. 8th)	77	Weather clear and cool; <i>rabi</i> injured in some places for want of rain; fever prevalent; prices slightly risen.
Jubbulpore ( " " )	.....	Weather seasonable; reaping of <i>kharif</i> crops and <i>rabi</i> sowings almost completed; rice 16 and wheat 18 seers per rupee.
Saugor ( " 6th)	.....	<i>Rabi</i> sowings finished; young crops progressing favourably; fever prevalent; prices steady.
Seoni ( " 7th)	.....	Weather cloudy; <i>kharif</i> reaping and <i>rabi</i> sowings approaching completion; fever prevalent; wheat and rice selling at 17½ seers per rupee.
Hoshangabad ( " " )	.....	Weather seasonable; <i>rabi</i> sowings progressing; fever and small-pox prevalent; wheat 15 and rice 9 seers per rupee.
Raipur ( " 4th)	119	Weather cloudy and rainy; <i>rabi</i> sowings going on; fever and cattle-disease prevalent; wheat 30 and rice 35 seers per rupee.
Sambalpur ( " 2nd)	65	Weather close and warm; fever increasing; rice 56 seers per rupee.
Khandwa ( " 7th)	.....	Days warm, nights cold; <i>rabi</i> sowings continue; cholera and small-pox prevalent; prices steady; rice 13 and wheat 16 seers per rupee.
<b>General Remarks.</b> —Slight rain in some districts; weather clear and pleasant; <i>rabi</i> sowings approaching completion; reaping of <i>kharif</i> crops going on; fever still reported; prices steady.		
<b>British Burma—(Nov. 4th)</b>		
Akyab ...	0.68	Total rainfall 199.46; public health and health of cattle both in town and district good.
Rangoon ...	0.77	Total rainfall 101.40; one death from cholera, otherwise public health good; crops making progress.
Bassein ...	3.33	Total rainfall 124.46; public health good; slight cattle-disease in two townships; condition of crops good.
Prome ...	0.95	Total rainfall 50.05; one case of cholera in town, otherwise public health good; crops progressing well, although but a slight yield is expected; several showers last week have been most beneficial; reaping of <i>koukyan</i> paddy commenced.
Amherst (Moulmein) ...	3.42	Total rainfall 202.90; four deaths from cholera reported from district, otherwise public health good both in Moulmein and district; no cattle-disease; crops ripening and in good condition.
Toungoo ...	2.66	Total rainfall 90.85; eight deaths from cholera and one death from small-pox in the district.
<b>General Remarks.</b> —Public health generally good; a few cases of cholera in Kyoukphyoo, Tavoy, Henzada and Toungoo; crop prospects good; rains nearly over.		

Presidency or Province and District.		Rainfall for week preceding.	State of agricultural prospects.
<b>Assam—</b>			
Gauhati	(Nov. 8th)	No rain	Weather seasonable; mornings foggy; prospects of crops and public health good.
Sylhet	( " " )	0·03	<i>Sali</i> paddy not likely to be a full crop; <i>amun</i> paddy promises well; cholera increasing.
Cachar	( " " )	·65	Weather cloudy and still unseasonably warm; prospects of <i>sali</i> crop good; common rice 25½ seers per rupee; two cases of cholera reported from Katigora.
Dibrugarh	( " " )	Nil	Weather seasonable; prospects of crops good; cattle-disease decreasing; public health good.
<b>Mysore and Coorg—</b> (Nov. 8th)			
Bangalore	...	3·96	Crops in good condition; <i>ragi</i> harvested in parts; prospects favourable; pasturage ample.
Mysore	...	·74	Wet and dry crops in good condition; prospects and public health good.
Mercara	...	·44	The heavy showers are injurious to the rice crop coming into flower; <i>ragi</i> harvest over in Naujarajapatna and is proceeding in Yeluvershime, yield short; prices falling owing to good prospects in Mysore; season feverish.
<i>General Remarks.</i> —Reports in regard to crops, prospects of season, and public health are favourable from all parts; agricultural operations continue active; prices easy—rice 11 to 15 seers and <i>ragi</i> 35 to 40 seers per rupee.			
<b>Berar &amp; Hyderabad—</b> (Nov. 8th)			
Amrāoti	...	.....	<i>Kharif</i> crops in good condition; <i>rabi</i> sowings completed; rain wanted; prices—wheat 16 and <i>juari</i> 28 seers per rupee.
Akola	...	.....	Crops progressing favourably; <i>rabi</i> sowings continue.
Hyderabad	...	·28	Total rainfall from 1st January 30·31; reaping of <i>kharif</i> and sowing of <i>tabi</i> in progress; cattle-disease prevails in two taluks; no sickness; prices—wheat 16½, common rice 11, white <i>juari</i> 28½, yellow <i>juari</i> 33½, and <i>tur</i> 25½ seers per current sicca rupee.
<b>Central India States—</b> (Nov. 8th)			
Indore	...	.....	Weather seasonable; health good; prospects of crops good; prices steady.
Morar (Gwalior)	...	No rain	Health and prospects good; weather seasonable.
Sutna	...	No rain	Health and prospects good.
Rutlam	...	.....	No report received.
Neemuch	...	No rain	<i>Kharif</i> harvest has been good; <i>rabi</i> being sown; health good.
Goona	...	.....	Crops good; health fair; wheat 22 seers per rupee.
Bhopal	...	.....	Weather cool; health and prospects good.
Agar	...	No rain	Prospects good.
Nowgong	...	No rain	Prospects and health good; prices steady.
Manpur	...	.....	Sowing of <i>rabi</i> crop continues; <i>juari</i> nearly ripe; prices stationary.
<b>Rajputana—</b>			
Abu	(Nov. 8th)	.....	Weather clear, cold set in; ague and fever prevail.
Sirohi	( " 5th)	.....	Tanks, wells, and health good; crops cut; nights cold.
Marwar	( " 3rd)	.....	About two months' water in tanks, wells most full; some fever prevails; crops being cut; days quite clear and nights still close, little wind; prices stationary.
Meywar	...	.....	No report received.
Harowti	(Nov. 4th)	.....	<i>Kharif</i> crops being harvested; <i>rabi</i> sowings still unfinished; weather seasonable; health good.
Jhallawar	( " 1st)	.....	Health and prospects continue good; weather seasonable.
Ajmere	( " 7th)	.....	<i>Kharif</i> crops reaped; <i>rabi</i> sowings progressing; health good.
Jeypore	...	.....	No report received.
Bhurlpore	(Nov. 7th)	.....	Prospects favourable; prices stationary; fever prevalent.
Ulwur	( " " )	.....	<i>Rabi</i> sowing continues; <i>kharif</i> being harvested; health fair.
<b>Nepal (Nov. 2nd)—</b>			
Katmandu	...	No rain	State of agricultural prospects good; beautiful weather.



## ABSTRACT SHOWING THE RESULT OF EMIGRATION FROM THE PORT OF CALCUTTA DURING THE MONTH OF MAY 1882.

*No. I.—As to age and sex.*

[There was no emigration to the Colonies.]

*No. II.—As to places whence emigrants come to Calcutta for embarkation.*

[There was no emigration to the Colonies.]

*No. III.—As to caste and religion.*

[There was no emigration to the Colonies.]

## ABSTRACT SHOWING THE RESULT OF EMIGRATION FROM THE PORT OF CALCUTTA DURING THE MONTH OF JUNE 1882.

*No. I.—As to age and sex.*

	FIJI.				NATAL.				TOTAL.		GRAND TOTAL.	REMARKS.
	Males.	Fe-males.	Total.	Proportion of women to men.	Males.	Fe-males.	Total.	Proportion of women to men.	Males.	Fe-males.		
Under 2 years	8	8	16	4276 women to every 100 men.	5	6	11	3483 women to every 100 men.	13	14	27	
From 2 to 10 years	21	10	31		12	5	17		33	15	48	
" 10 " 20 "	99	47	146		81	26	107		180	73	253	
" 20 " 30 "	203	81	284		180	62	242		383	143	526	
" 30 " 40 "	9	5	14		6	3	9		15	8	23	
" 40 " 50 "	...	...	...		...	2	2		...	2	2	
Above 50 "	...	...	...		...	...	...		...	...	...	
GRAND TOTAL	340	151	491		284	104	388		624	255	879	

*No. II.—As to places whence emigrants come to Calcutta for embarkation.*

	FIJI.			NATAL.			TOTAL.		GRAND TOTAL.	REMARKS.
	Males.	Fe-males.	Total.	Males.	Fe-males.	Total.	Males.	Fe-males.		
Orissa	...	...	...	...	...	...	...	...	...	
Western Bengal	...	...	1	...	...	...	...	...	1	
Central "	...	...	...	...	...	...	...	...	...	
Eastern "	...	...	...	...	...	...	...	...	...	
Behar	...	...	...	...	...	...	...	...	...	
North-Western Provinces	...	5	2	...	44	22	...	49	24	73
Oudh	...	161	76	...	153	60	...	314	136	450
Central India	...	109	61	...	66	20	...	175	81	256
Punjab	...	14	8	...	11	1	...	25	9	34
Nepal	...	48	3	...	6	1	...	54	4	58
Mixed, Madras and Bombay, &c.	...	2	...	...	1	...	...	3	...	3
	...	1	...	...	3	...	...	4	...	4
GRAND TOTAL	340	151	491	284	104	388	624	255	879	

*No. III.—As to caste and religion.*

	FIJI.			NATAL.			TOTAL.		GRAND TOTAL.	REMARKS.
	Males.	Fe-males.	Total.	Males.	Fe-males.	Total.	Males.	Fe-males.		
Brahmins, high caste	...	90	26	...	52	18	...	142	44	186
Agriculturist	...	72	31	...	83	20	...	155	51	206
Artisans	...	7	2	...	14	2	...	21	4	25
Low castes	...	119	50	...	73	33	...	192	83	275
Musulmans	...	52	42	...	62	31	...	114	73	187
Christians	...	...	...	...	...	...	...	...	...	
GRAND TOTAL	340	151	491	284	104	388	624	255	879	

*Memo.*

	Male.	Female.	Total.
1. Hindus	510	182	692
2. Musulmans	114	73	187
3. Christians	...	...	...
TOTAL	624	255	879

## CULTIVATION OF THE JAPAN PEA IN INDIA.

## No. 634.

*Extract from the Proceedings of the Government of India in the Revenue and Agricultural Department, dated Simla, the 2nd November 1882.*

Read the following papers regarding the Japan pea :—

Extract from the Proceedings of a Meeting of the Agricultural and Horticultural Society of India held on the 2nd September 1881.

## JAPAN PEA.

Read a letter from Captain J. F. Pogson, forwarding an extract from an American paper (*Mississippi Patron*) respecting a prolific pea raised in Japan, and suggesting that steps be taken towards obtaining a quantity of this variety for trial in India, which was agreed to.

The following is the extract alluded to :—

“ Mr. T. E. Martin and Mr. R. T. Rutledge, both American progressive farmers, state that the “ Japan Pea ” is the most productive as well as good food that they have ever grown for all kinds of stock ; horses, cattle, sheep, and hogs will eat the peas, stems, and leaves, if harvested before fully matured and cured like other hay, with as much relish as they do corn. Then there is no pea for the table—it is soaked in water the night before cooking—that has a more exquisite flavour. They grow on a stout bushy stalk from two to three feet high, somewhat resembling the cotton plant. The main stalk, as well as the branches of the limbs, are literally loaded with small pea-pods, filled with little yellow peas, similar in colour, size, and flavour to the English garden pea.”

As regards cultivation, they state : “ But the way to get the greatest yield is to plant in hills two and a half feet each way, allowing but one stalk to the hill to remain after the first working. That will give you 6,960 stalks to the acre, and on ordinary land, cultivated the same as corn, will average at the lowest estimate a pint of shelled peas to the stalk, or a fraction over 108½ bushels per acre. I doubt not that with high cultivation and good soil it would be an easy matter to double that yield, besides there is no other crop that will yield more hay to the acre. In fact, I know of no crop so remunerative as the Japan pea. It is a sure cropper, as clearly demonstrated by my experience with this season's crop. Neither wet nor dry weather materially interferes with the quantity or quality of the yield.”

Paper on the Soy Bean by Edward Kinch, F.I.E., F.C.S., &c., Professor of Chemistry, Royal Agricultural College, Cirencester.

## THE SOY BEAN.

This bean, sometimes known as the Japan pea and China bean, is the seed of the *Soja hispida*, Miquel—(*Glycine hispida*, Moench ; *Dolichos Soja*, Linne ; Siebold ; *Glycine Soja*, Jaquin)—a plant of the natural order Leguminosæ, sub-order Papilionacæ, and tribe, Phaseolæ. Its natural habitat appears to be China and Japan ; it also grows in Mongolia, and in India in the Himalayas, and within the last few years it has been cultivated experimentally in several European countries. This bean is worth more than a passing notice, as it is the vegetable which approaches most nearly in its proximate chemical composition to animal food. This will be seen later on.

There are a great number of varieties of the soy bean known, which differ to some extent in the shape, size, and especially in the colour of the seed, and in a few minor particulars, but which seem to vary comparatively little in chemical composition. Dr. C. O. Harz has classified the principal varieties as follows :—

Group I. *S. hispida platycarpa.*

- |     |                      |
|-----|----------------------|
| (1) | <i>olivacea.</i>     |
| (2) | <i>punctata.</i>     |
| (3) | <i>melanosperma.</i> |
| (a) | <i>vulgans.</i>      |
| (b) | <i>nigra.</i>        |
| (c) | <i>renisperma.</i>   |
| (d) | <i>rubro-cincta.</i> |
| (4) | <i>platysperma.</i>  |
| (5) | <i>pervula.</i>      |

Group II. *S. hispida tumida.*

- |     |                            |
|-----|----------------------------|
| (6) | <i>pallida</i> (Roxburgh). |
| (7) | <i>castanea.</i>           |
| (8) | <i>atrosperma.</i>         |



These names sufficiently indicate the nature of the variety as far as the seed is concerned.

The soy bean is extensively cultivated in the north of China, whence it is exported to the southern provinces; it is here pressed for the sake of its oil, and the residual cake largely used as food for man and beast, and also as a manure.

In Japan it is known by names signifying the bean, and from it are made not only soy but a paste, known as *miso*, which is in constant request at nearly every meal, *tofu* or bean cheese, and other foods used to a less extent. This bean cheese is also well known in China, and is obtained by extracting the legumin from the beans with water and precipitating it with brine. An analysis of it is given below.

These foods are most valuable additions to the dietary of the Oriental nations, and especially of the Japanese, who use so little animal food; they tend to supply the deficiencies of the staple food, rice, in nitrogenous matter, fat, and also in mineral constituents.

The Buddhist priests, who are strictly forbidden the use of animal food, consume considerable quantities of these beans, principally in the form of *miso*.

The soy bean first attracted attention in Europe in the year 1873, when specimens from Japan, from China, and from India were shown at the Vienna International Exhibition. Dr. Forbes Watson, Reporter on the products of India, called attention to it in the catalogue of the exhibits of the India Museum. Since then numerous experiments have been made on the European continent on its growth, and also feeding experiments with the bean and its straw on different kinds of animals have been prosecuted. Such experiments have been carried on by Woolling and Wein at Munich; by Haberlandt, Lehman, Harz, Stahel, Zimmerman, Siewert, Wieske, and others at various stations in Germany, Austria, and Hungary; and experiments have also been made in France and in Italy.

The proximate chemical composition of some of the different varieties, grown in different places, is now given and compared with the composition of some other foods of vegetable and animal origin:—

Percentage composition of the soy bean.

	Pale Yellow.				Brown.	Round black.	Long black.
	Japan.	China.	Germany. &c.	India.			
Water ...	11.3	9.0	9.5	12.0	9.3	11.2	12.7
Nitrogenous matter ...	37.8	32.0	34.5	36.0	35.1	33.0	35.8
Fat ...	20.9	18.0	18.0	18.0	17.8	17.2	14.2
Carbohydrates ...	24.0	32.0	28.5	{ 30.0 }	28.6	29.7	28.5
Fibre ...	2.2	4.0	4.5	{ }	4.5	4.2	4.4
Ash ...	3.8	5.0	5.0	4.0	4.7	4.7	4.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0

It has been shown by Levallois (*Comptes Rendus*) that the soy bean contains a special variety of sugar, in many of its properties resembling mellitose; this constitutes about ten per cent. of the soluble carbohydrates. Of the nitrogenous matters nearly all is in the form of albuminoids; a small quantity, about .1 per cent., appears as a peptonelike body, and about .1—2 per cent. is non-albuminoid.

Percentage composition.

					Lean	Fat
	Peas.	Beans.	Lupins.	Lentils.	Beef.	Mutton.
Water ...	14.0	14.8	12.2	12.5	72.0	53.0
Nitrogenous matter ...	23.0	24.0	28.3	25.0	19.0	12.0
Fat ...	1.7	1.6	5.0	1.8	4.0	32.0
Carbohydrates ...	53.8	49.5	36.4	54.6		
Fibre ...	5.0	7.0	14.1	3.6		
Ash ...	2.5	3.1	4.0	2.5	5.0	3.0
	100.0	100.0	100.0	100.0	100.0	100.0

These analyses show the greater richness of the soy beans in nitrogenous matter and in fat than the common bean and pea, and that, when the water is equalised, it more nearly approaches meat in proximate composition. The only leguminous seed, of common occurrence, which contains more oil than this bean, is the earth nut or ground nut *Arachis hypogæ*, which is now so largely cultivated abroad for its oil and its cake. In order to compare the soy bean straw with hay and with other straws of like nature, the following average analyses are given :—

			Meadow hay.	Bean straw.	Pea straw.	Lentil straw.	Soy bean straw.	Soy bean hulls.
Water	...	...	14.0	16.0	15.0	14.5	11.3	10.2
Nitrogenous matter	...	...	8.2	10.0	7.0	14.1	7.8	6.0
Fat	...	...	2.0	1.0	2.0	2.0	2.2	1.5
Carbohydrates	...	...	39.8	34.5	34.0	26.4	41.6	43.0
Fibre	...	...	30.0	34.0	38.0	36.6	24.0	31.0
Ash	...	...	6.0	4.5	4.0	6.4	12.2	8.3
			100.0	100.0	100.0	100.0	100.0	100.0

A special variety of the soja hispida is cultivated in some parts of Japan as a fodder crop, and cut just as the pods are fully formed. The hay made from this is much relished by horses, cattle, and sheep. A sample of a crop grown on the Imperial College of Agriculture Farm, Komaba Tokiyo, gave on analysis :—

Water	...	...	...	...	...	...	15.0
Nitrogenous matter	...	...	...	...	...	...	19.8
Fibre	...	...	...	...	...	...	35.9
Ash	...	...	...	...	...	...	6.8
Carbohydrates and fat	...	...	...	...	...	...	22.5
							100.0

It will be seen that this hay exceeds even lentil straw in the amount of nitrogenous matter it contains.

The following are means of various analyses made in Japan of food products obtained from the soy bean, and which are largely consumed there :—

Percentage composition.

			White miso.	Red miso.	Bean cheese.	Frozen bean cheese.
Water	...	...	50.7	50.4	89.0	18.7
Nitrogenous matter	...	...	5.7	10.0	5.0	48.5
Fat	...	...	{ 24.4	18.9 }	3.4	28.5
Carbohydrates	...	...	{	}	2.1	2.6
Fibre	...	...	12.6	8.2		
Ash	...	...	6.6	12.5	.5	1.7
			100.0	100.0	100.0	100.0

The ash of the miso consists mainly of common salt which is added in the process of manufacture.

The ash of the soy bean was found, as a mean of several samples, to have the following percentage composition. The composition of that of the straw is also given :—

				Soy bean ash.	Straw ash.
Potash	...	...	...	44.5	15.4
Soda	...	...	...	1.1	2.2
Lime	...	...	...	5.6	44.2
Magnesia	...	...	...	9.1	15.4
Ferric oxide	...	...	...	.8	.8
Chlorine	...	...	...	.2	.2
Phosphorus pentoxide	...	...	...	32.7	9.4
Sulphur trioxide	...	...	...	6.0	6.4
Silica	...	...	...		5.5
				100.0	99.5

The crop takes from the soil a large amount of the valuable mineral constituents, phosphoric acid and potash, as well as a large amount of nitrogen.



The results of the German and Austrian experiments show that where the temperature is not too low, the results of the harvest as compared with that of ordinary beans or peas is exceedingly satisfactory.

The kinds most suited for cultivation there are the yellow, brown, round black, and long black varieties, *i.e.*, *pallida*, *castanea*, *atrosperma*, and *melamosperma*, especially the first three named. They require a vegetation time of about 150 days, during which the average temperature must be about 58°F. (14.3°C.), and the sum of the heat (the average temperature multiplied by the number of days) about 2,100°C. They may be sown in the beginning of May, and harvested the end of September or even the beginning of October.

The seeds should not be sown deeply, not more than 1 to 1½ inches deep, and about 18 plants to the square yard may be left after weeding and thinning out. The plants grow to a small bush about 2½ feet high, and produce pods with two, three, and occasionally four or even five seeds. The most suitable soil is a peaty soil, or one containing a good deal of organic matter, and the next most favourable is a calcareous soil. Nitrate of soda has been found to be a good manure for the crop in Germany, and also potash salts, especially potassium sulphate. Ammonium sulphate did not give so good a return as the same amount of nitrogen in the form of nitrate; on soils poor in organic matter it would probably be better to supply the nitrogen in some organic combination, such as rape cake, shoddy, and the like. Phosphoric acid, especially as dicalcic phosphate, was a help on some soils.

Field experiments made by myself on this crop in Japan showed that wood ashes had a good effect, and that anything like an excess of nitrogen in the manure was very harmful to the yield of grain: in that country the plants are often sown on the dividing ridges between the plots of paddy and without any manure. The yield of seed and straw in the German experiments compares very favourably with that of beans and peas grown under the same conditions: from 2,000 to 3,000 lbs. of seed and 5,000 to 10,000 lbs. of straw per acre have been obtained.

Feeding experiments with the produce have been made with pigs, sheep, oxen, and milk cows, and with very good results. The bean is a most excellent addition to other foods, especially such as are deficient in nitrogenous matter and fat. The digestion co-efficients of the nitrogenous matters, of the fat, and of the total non-nitrogenous matter in the soy bean, and also in the cake left after its pressure for oil, closely approximate to 90 in each case. As a mean of two direct experiments with soy bean straw, the digestion co-efficients were found to be as follows: Nitrogenous matter 60.8, fat 62.2, fibre 33.6, and non-nitrogenous extractive matters 69.0. The huds are rather less digestible.

The albuminoid ratio in the beans is about 1:2.3, in the straw 1:8.1, in the huds about 1:20, and in the cake 1:1.3.

An analysis of the cake shows:—

Percentage composition.							
Water	...	...	...	...	...	...	13.4
Nitrogenous matter	...	...	...	...	...	...	40.3
Fibre	...	...	...	...	...	...	5.5
Carbohydrates	...	...	...	...	...	...	28.1
Fat	...	...	...	...	...	...	7.5
Ash	...	...	...	...	...	...	5.2
							100.0

In good condition it would be a valuable addition to our feeding cakes, but it is too highly valued in the East to enable it to be imported to any extent at a profit.

The soy bean plant has considerable power of resisting unfavourable climatic influences as cold, drought, and wet; and appears to be particularly free from insect attacks, and indeed from all parasites; this last, if it continues, is by no means a slight advantage. The soy beans are eagerly bought by the natives of Southern Italy, an almost vegetarian race. That they are easily digested I can speak from experience, having frequently used them on my table cooked after the manner of haricots. Taking into account the great richness of these beans in valuable food constituents, their easy digestibility, the value of the straw, and the great probability of some variety being able to be acclimatized without great trouble, this *soja hispida* is worth consideration. The bean would form an exceedingly useful addition to the food of the poorer classes, as a substitute for a portion of the animal food which in the kitchens of the labouring classes is so wastefully cooked. One use it has already found, not altogether to be commended, *viz.*, after roasting, as an adulterant of, and substitute for, coffee.

We have procured seeds of several varieties direct from Japan, and of one variety from Germany, and these are now being cultivated in the Botanic Garden. They were sown rather late, and the month of June has not been favourable to their growth, but some of the varieties promise fairly.

No. 1853, dated 11th October 1882.

From—J. R. REID, Esq., Offg. Secy. to Govt., North-Western Provinces and Oudh,

To—The Secy. to the Govt. of India, Revenue and Agricultural Department.

In reply to your letter No. 119-A. and H., dated the 18th February last, I am directed to submit, for the information of His Excellency the Governor General in Council, a copy of the letter noted on the margin, containing a report on the cultivation of the Japan pea in the Mussoorie and Chajuri gardens.

No. 2406, dated Saharanpur, 20th September 1882.

From—J. F. DUTHIE, B.A., F.L.S., Superintendent, Government Botanical Gardens, North-Western Provinces and Oudh,

To—The Director, Department of Agriculture and Commerce, North-Western Provinces and Oudh.

In reply to your No. 1227A., dated 1st instant, I have the honour to forward a report received from the Native Overseer on the cultivation of the "Japan pea" at Mussoorie and Chajuri. This plant appears to be nothing more than an improved variety of a commonly cultivated hill pulse called "bhat" (glycine soja) or soy bean.

About three years ago I received seed of the same plant from the Director of the Oriental Museum in Vienna, together with high recommendations regarding its value as a source of food, an opinion borne out by the very large proportion of nitrogenous substances contained in the seed (see Baden-Powell's Punjab Products, Volume I, page 243).

Three pounds of seed were sent to the Overseer for sowing in both gardens.

At the Mussoorie garden one pound was sown on the 12th March last, and not a single seed germinated.

*Cultivation at Chajuri.*

Weight of seed	...	...	...	...	2 lbs.
Dates of sowing	...	...	...	...	28th February and 6th March 1882
Area of ground	...	...	...	...	36 feet x 12 feet.
Weight of manure	...	...	...	...	12 maunds.
Proportion of seed which germinated	...	...	...	...	About half.
Date on which the ripe seed was collected	...	...	...	...	25th July 1882.
Weight of seed produced	...	...	...	...	2 lbs. 12 oz.

OBSERVATIONS.—The Government of India desires that the cultivation of the Japan pea should be extended in this country, and in this view it is suggested that further experiments should be made in suitable places. A fresh supply of seed will be procured from Japan for distribution to such Local Governments and Administrations as may wish to try the experiment.

The Government of Madras.  
 " Bombay.  
 " Bengal.  
 " North-Western Provinces and Oudh.  
 " Punjab.  
 The Chief Commissioner, Central Provinces.

The Chief Commissioner, British Burma.  
 " Assam.  
 " Ajmere.  
 " Coorg.  
 The Secretary for Berar to Resident at Hyderabad.

ORDER.—Ordered, that a copy be forwarded to the Local Governments and Administrations noted in the margin

for information.

Ordered also, that a copy be forwarded to the Honorary Secretary, Agricultural and Horticultural Society of India, with a request that the Government of India may be informed whether the Society would like to try any experiment with the Japan pea.

Ordered also, that a copy of the papers be published in the Supplement to the *Gazette of India*.

E. C. BUCK,  
*Secretary to the Government of India.*



GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

THE CENTRAL PROVINCES LOCAL SELF-GOVERNMENT BILL.

No. 810, dated the 15th July, 1882.

From—D. FITZPATRICK, Esq., Secretary to the Government of India, Legislative Dept.,  
To—The Chief Commissioner of the Central Provinces.

I AM directed to forward for your opinion, and that of all Commissioners and Deputy Commissioners in the Central Provinces, a provisional draft of a Bill to make better provision for local self-government in the Provinces under your administration.

2. The Bill was introduced as a Bill to provide for the levy of rates on land in the Central Provinces, and in that form it was seen and approved by you when you were in Calcutta.

Since that time the publication of the Government of India Resolution No. <sup>17</sup><sub>747-750</sub> dated 18th May, 1882, on the subject of local self-government, has altered the aspect of the case. It has been necessary to revise the Bill to bring it into accordance with the main lines of the scheme laid down by Government.

As it is the first piece of legislation in which the views set forth in the abovenamed Resolution are embodied, more importance attaches to it than if it was a measure connected with the Central Provinces only. On this account it is thought expedient to subject the draft to your criticism before republishing it in the Gazette in ordinary course.

3. I am to observe that the Bill is in the form of a provisional draft, and that criticism should be directed to the substance of the measure rather than to the wording or form of the Bill.

4. Attention is particularly requested to the following points:—

- (1) The formation of local administrative areas.
- (2) The constitution of local administrative bodies.
- (3) The relations of those bodies to each other.
- (4) The conduct of business by them.
- (5) Their duties.
- (6) The control to be exercised over them by the executive officers and by the Local Government.
- (7) The funds to be assigned to and placed under the control of the local administrative bodies.
- (8) The power to be given to them of providing funds by additional taxation.
- (9) The appropriation of local funds.
- (10) The question of giving allowances to members of local bodies.

I am to take up these points in the order in which they are enumerated above.

5. *First*, as to the formation of the local administrative areas (section 3 of the draft). In accordance with the opinion of the Member in charge of the Bill, the village has been taken as the basis of the scheme, and the areas for administrative purposes are to be formed by aggregating the villages in circles, and the circles in groups. In forming the circles and groups, regard will be had to community of interests in such matters as roads, ferries, dispensaries, schools, and the like.

The Government of India wishes you to consider, not only whether this is the best system to adopt for the Central Provinces, but whether it is expedient to formulate it in the Act rather than to leave it to be provided for by rules.

The Member in charge of the Bill is strongly of opinion that, in the case of the Central Provinces, the basis of village-representation should be laid down by law. He considers that the only way in which vitality can be given to a scheme of self-government is by engrafting it on some living indigenous institution. The village is the natural unit in all Indian administration, and it is the only remaining seat of political life. He wishes this fact to be recognised and established in the law.

6. *Secondly*, the constitution of the local bodies (section 4) naturally follows the lines laid down in section 3. Each group of villages (which may or may not correspond to one of the revenue-subdivisions of a district) is to have its local Board. The representatives of the village-circles will form the chief element of the Board. The method of their election or appointment is left to rules to be framed by you (section 30). To them will be added members of the mercantile classes or professions, appointed or elected in such manner as may be prescribed by rule (section 30); and such persons, if any, as the Chief Commissioner may from time to time appoint. In this last class may be included such officials, or non-official persons, as the Chief Commissioner may think it necessary to add to the Board. It has not been thought necessary to make *ex officio* members. It may be that in some places the Board, constituted of classes (a) and (b), may be strong enough to walk alone; and in that case you need not exercise the power given to you under clause (c) of section 5. In other cases the representative Board may require strengthening, or influential men may have been left out, whose presence on the Board appears to you expedient. With the exception of the numerical limit placed on the number of nominated members,—a limit that is obviously necessary—it is intended to give the Local Administration as much discretion as possible.

The formation of the District Council is similar to that of the local Board, representatives of the larger areas—the groups—taking the place of representatives of circles.

Here, again, I am to ask you to consider, not only whether the scheme is suitable, but also whether you think it expedient to formulate it in the law.

7. *Thirdly*, as to the relations of local Boards to each other and to the District Council (sections 10 to 16). The normal constitution contemplated in the draft is that by which the local Boards shall be subordinated to the District Council. In a Province like that administered by you, this will perhaps be the necessary relation of the two bodies for some time to come. Section 14, however, provides for a case in which a local Board is capable and desirous of independent action. You will have the power to declare any Board independent, in which case, by clause (4), section 21, it will have complete control over its share of the District Fund.

Section 14 as drafted does not give the Chief Commissioner power to recall the independence thus given to a local Board. It may perhaps be necessary to give you this power.

Provision has been made in sections 15 and 16 for the joint action of several local Boards and of several District Councils for the prosecution of a common object.

In all these matters, the Government of India is desirous of leaving as much room as possible for the natural development of local varieties, which will arise from the teachings of experience and the differences in the condition and character of the people.

8. *Fourthly*, with regard to the conduct of business. Section 30 gives the Chief Commissioner power to make rules on the more important matters, while section 18 gives the Councils and Boards as much freedom as possible in managing their affairs, subject, however, to the rules framed by you. The appointment of a Chairman is regulated by the law (section 17). You will observe that the appointment is to be by election, subject to approval by you in the case of a District Council, and by the Commissioner in the case of a local Board.



On this point the Bill as at present framed leaves less discretion to the Local Government than was contemplated by the Resolution of 20th May last. Your criticism on these provisions is invited.

9. *Fifthly*, as to the duties of the Boards and Councils. Section 9 enumerates the matters which it appears expedient to place under the control and administration of these bodies. I am to ask that the list may be carefully examined, and that you will say if there are any matters which have been omitted or which ought to be more prominently mentioned, and if there are any included which it is expedient to leave out. You will observe that the matters which local bodies may administer and control (section 9) have been distinguished from those to which the District Fund may be devoted (clause (3), section 21).

10. *Sixthly*, the subject of control requires careful consideration. The intention of the draft is to guard against any undue interference on the part of the District Officers with the management by the local bodies of the business entrusted to them, while at the same time the authority of that officer, as the representative of the Executive Government, and his power to prevent mischief, is maintained. You will be able to say whether this intention has been sufficiently carried out by clause (5), section 22, as regards finance, and by sections 26 and 27 as regards general business. Sections 28 and 29 provide for cases of default or abuse of powers by local bodies, and give the Chief Commissioner ample powers of dealing with delinquent Councils or Boards. In England, analogous powers for the supersession of local administrative bodies are vested in the Local Government Board and the Education Department.

11. *Seventhly*, the heads of income which can be assigned to the District Fund are specified in section 21. The District Council should, as far as possible, be entrusted with the management of the sources from which this income is derived. This principle will not apply to the rates named in clause (a) of section 21, but it may apply to the heads of income mentioned in clauses (b) and (c). The management of pounds and ferries should certainly form part of the business of the local Boards, and the income from the pounds and ferries under the management of a Board or Council should belong to that Board or Council. Under the present law, the Chief Commissioner has the power to assign to each district from the provincial surplus accruing from these sources such sums as he may think fit. It should be considered whether any amendment of the law is necessary.

12. *Eighthly*, the very important question arises whether any, or what, powers should be taken of raising rates for local purposes. It is believed that the local bodies in the Central Provinces will have but scanty funds at their disposal, and that they will depend almost entirely on the supplies which you may from time to time assign to them from Provincial revenues. The Government of India is of opinion that, in order to give stability to local finance, these assignments should, as in the case of assignments to Provinces, be made for fixed periods of years.

If the proposed measure succeeds, the District Councils will, in all probability, feel the want of funds. Should this want be foreseen and provided for by the present Bill, or should legislation be deferred until the demand arises?

In the present Bombay and Madras District Committees Acts (Bombay Acts III, 1869, and II, 1871; Madras Act IV, 1871) certain powers of taxation are vested in the Government.

If any provision for raising funds is to be embodied in the present measure, it would probably take the shape of empowering the District Councils to suggest taxation, in forms and under limits to be laid down in the law, and of enabling the Government to act on such suggestions. For example, they might be allowed to suggest the establishment of tolls on highways maintained by them, or the imposition of market-dues necessary for the maintenance of market-places, and the like. The power of sanction would rest with the Government, and the form and limit of the toll or due would be laid down in the law.

I am to ask for your careful consideration of this matter.

13. *Ninthly*, you should consider how far it may be possible or expedient to limit and specify, more precisely than under the existing system, the purposes to which funds raised from a particular source or from a particular area may be appropriated. Under the Bill the District Fund may be applied towards all or any of the purposes mentioned in section 9 or in section 22 (3); but by section 30 (d) power is given to the Chief Commissioner to make rules as to the apportionment of the fund between general and special purposes, and the appropriation of funds raised in a particular area to purposes of that area. The principles on which such rules should be framed will require careful consideration.

14. *Tenthly*, the question has arisen whether any allowances should be given to the Members of local Boards and District Councils. In some cases the representatives of village-circles or groups will not be wealthy men, and it is important that they should not be deterred by unwillingness to incur the necessary expense from punctual attendance at all Board or Council meetings. The mukaddams or village-headmen will, it is understood, be remunerated by the village under the provisions of the Central Provinces Revenue Act, and it may not be necessary to give them any additional remuneration for attendance at the local Board. But those who are appointed to the District Council may have long distances to travel; and it may be just and expedient to pay them travelling allowance or a fee for each attendance at the Council.

At the next settlement of the land-revenue it may perhaps be possible to put the position of village-headman on a more substantial basis, and to follow the Panjáb practice of attaching some valued privileges to the post. Meanwhile, it must be understood that whatever charges it is proposed to incur for this purpose must be met from the District Fund. Your advice on this matter will be looked for.

15. In conclusion, I am to draw your attention to two matters. *First*, no definite position has been assigned to the Commissioner of the Division in the draft. It is difficult to give him any definite functions which ought not more properly to belong to the Deputy Commissioner. But it is to be understood that he will exercise the same authority and control over the Deputy Commissioner in the discharge by that officer of his duties under this Act as he exercises over him in other matters. *Secondly*, it is thought possible that the Act may be inapplicable to some of the wilder parts of the Central Provinces. Section 31, therefore, gives you the power to except from any of the provisions of the Act such districts or portions of districts as may be in your opinion unfit for self-government.

### No. III.

## THE CENTRAL PROVINCES LOCAL SELF-GOVERNMENT BILL, 1882.

### CONTENTS.

#### PREAMBLE.

#### *Preliminary.*

#### SECTIONS.

1. Short title.  
Local extent.  
Commencement.
2. Definitions.

#### *Formation of Local Administrative Areas.*

3. Aggregation of villages in circles and groups for purposes of local self-government.

#### *Constitution of Local Administrative Bodies.*

4. Establishment of local boards for groups and of district councils for districts.



SECTIONS.

5. Constitution of local board.
6. Constitution of district council.
7. Disqualification for being member of board or council.
8. Incorporation of district council.

*Duties of District Councils and Local Boards.*

9. Matters to be administered by board and council.

*Relations of Local Board to District Council.*

10. Limits on expenditure of local board.
11. Periodical reports, estimates and accounts by board to council.
12. Power for council to reverse or vary resolution of board.
13. Power for council to provide for execution of works in default of board.
14. Power to declare local boards independent.

*Joint Committees.*

15. Joint committee of two or more local boards.
16. Joint committee of two or more district councils.

*Conduct of Business.*

17. Chairman.
18. Regulations as to meetings and proceedings.

*Officers and Servants.*

19. Employment of officers and servants.

*Vesting of Property.*

20. Power to vest property in district council.

*Finance.*

21. Constitution, custody and application of district fund.
22. Annual estimates of income and expenditure.
23. Annual accounts and audit.
24. Inspection of estimates and accounts.
25. Publication of abstract of accounts.

*Control.*

26. Deputy Commissioner's power of supervision.
27. Power to suspend execution of orders, &c.
28. Power to provide for performance of duties in default of district council.
29. Power to supersede council or board in case of default or of abuse of powers.

*Rules.*

30. Power for Chief Commissioner to make rules as to district councils and local boards.

*Exceptional Provision.*

31. Power under special circumstances to except districts from operation of Act.

*Supplemental and Temporary Provision.*

32. Confirmation and recovery of existing rates.
33. Account of receipts and charges to be kept by Deputy Commissioner.
34. Powers of Chief Commissioner with respect to rates.
35. Penalty on member, officer or servant being interested in contracts made with council, board or committee.
36. Publication of rules and orders.
37. Time for councils and boards coming into existence.
38. Saving of rights of existing officers.

## No. III.

*Provisional draft of a Bill to make better provision for local self-government in the Central Provinces.*

WHEREAS provision has been made by the Central Provinces Land-revenue Act, 1881, for the appointment of executive headmen, or mukaddams, for the several villages in the territories administered by the Chief Commissioner of the Central Provinces; and

Whereas provision has been made in the settlement-records of the districts in those territories for the levy of rates for the maintenance of roads, schools and the district post, and it is proposed that the Government shall, from time to time, assign certain sums, or the income accruing from certain sources, for expenditure on objects tending to promote the welfare and improvement of the inhabitants of each of those districts;

It is hereby enacted as follows:—

*Preliminary.*

1. This Act may be called the Central Provinces Local Self-government Act, 1882. It shall extend only to the territories for the time being administered by the Chief Commissioner of the Central Provinces; and it shall come into force on the day of 1882.
2. "Assistant Commissioner" includes an Extra Assistant Commissioner in any district where there is no Assistant Commissioner.

"Financial year" means the year commencing on the first day of April.

"Rate-payer" means any person liable to pay any rate leviable for the maintenance of roads, schools or the district post under any settlement made before the passing of this Act.

"Village" includes any tract of land which, at the last settlement of that land, has been recognized as a village, or which the Chief Commissioner may, from time to time, declare to be a village for the purposes of the Central Provinces Land-revenue Act, 1881.

*Formation of Local Administrative Areas.*

3. (1) The Chief Commissioner shall, by order, for the purposes of the local self-government of each district, aggregate the several villages thereof in circles, and the circles in groups.

(2) In forming the circles and groups regard shall be had to the community of interests for purposes of this Act between the several villages comprised in each circle, and between the several circles comprised in each group.

(3) There shall be excluded from the circles and groups formed under this section such portions of the district as are for the time being included in the limits of a military cantonment or of a town having a municipal committee.

(4) The Chief Commissioner may, from time to time, by order, vary any order made under this section.

*Constitution of Local Administrative Bodies.*

4. There shall be established a local board for each group of circles, and a district council for each district.

Constitution of local board.

5. The local board for a group of circles shall consist of—

- (a) representative members, one for each circle, being the headman of a village within that circle;
- (b) representatives of mercantile classes or professions, resident within the area comprised in the group, and chosen by or on behalf of those classes or professions; and



- (c) such person or persons, if any, not exceeding in number *one-third* of the board, as the Chief Commissioner may from time to time appoint.

Constitution of district council.

6. The district council of a district shall consist of—

- (a) representatives of groups of circles within the district, one for each group, being a member of and selected by the local board for that group ;  
 (b) representatives of mercantile classes or professions, resident within the district, and chosen by or on behalf of those classes or professions ; and  
 (c) such person or persons, if any, not exceeding in number *one-third* of the council, as the Chief Commissioner may from time to time appoint.

7. (1) A person who has been convicted of an offence punishable with imprisonment, or has been made a bankrupt, shall be disqualified for being elected or appointed a member of a local board or district council.

(2) If a member of such a board or council is convicted of such an offence, or is made bankrupt, his office shall thereupon become vacant.

8. Every district council shall be a body corporate by the name of the district council of its district, and shall have perpetual succession and a common

Incorporation of district council.

seal, with power to acquire and hold property, both moveable and immoveable, to transfer any moveable property, and, with the previous approval in writing of the Deputy Commissioner, any immoveable property, held by it, and to contract and to do all other things necessary for the purposes of its constitution.

*Duties of District Councils and Local Boards.*

9. The following matters shall, subject to such exceptions as the Chief Commissioner may, from time to time, make by order, be under the control and administration of the district council and of the local boards within the areas of their jurisdictions :—

Matters to be administered by board and council.

- (a) The construction, repair and maintenance of roads and other means of communication.  
 (b) The construction and repair of school-houses, hospitals, dispensaries, lunatic asylums, markets, rest houses, saráis and other public buildings.  
 (c) The supply, storage and preservation from pollution of water for drinking and cooking purposes.  
 (d) The construction and repair of public wells and tanks, or water-works, and the supply of water therefrom.  
 (e) The planting and preservation of trees on public ground.  
 (f) The establishment and maintenance of relief-works in time of famine or scarcity.  
 (g) Any other local works or measures likely to promote the health, comfort or convenience of the public.  
 (h) The visiting and management of hospitals, dispensaries, markets and schools.  
 (i) The maintenance of any building or property vested under this Act in the district council.

*Relations of Local Board to District Council.*

10. A local board shall not incur expenses or undertake liabilities to any amount exceeding the limit imposed by the district council of its district.

Limits on expenditure of local board.

11. Every local board shall submit annually to the district council of its district a statement of the requirements, and an estimate of the probable expenditure, of the board for the coming financial year, and a report of its proceedings, and an account of its receipts and expenditure for the past financial year, and shall also submit to the council such other reports, if any, as the council may, from time to time, require.

Periodical reports, estimates and accounts by board to council.

12. A district council may, by a majority of *two-thirds* of its whole number, reverse or vary any resolution of a local board for an area within its district.

Power for council to reverse or vary resolution of board.

13. (1) If a local board makes default in performance of any duty imposed on it by or under this Act, the district council may, by order in writing, fix a period for the performance of the duty.

Power for council to provide for execution of works in default of board.

(2) If the duty is not performed within that period, the council may appoint some person to perform it, and may provide for the expenses of and incidental to its performance out of the funds appropriated to or for the purposes of the local board.

14. (1) The Chief Commissioner may, from time to time, by notification in the local official Gazette, declare any local board established under this Act to be an independent board.

Power to declare local boards independent.

(2) A local board so declared shall thereupon within its area have the powers and perform the duties of a district council under this Act, and shall cease to be under the control of the district council.

#### *Joint Committees.*

15. (1) A local board may, from time to time, concur with any other local board or boards for an area in the same district, in appointing, out of their respective bodies, joint committees for any purpose in which they are jointly interested, and in delegating to any such committee any power which might be exercised by either or any of the local boards, and in framing and modifying regulations as to the proceedings of any such joint committee.

Joint committee of two or more local boards.

(2) If any dispute arises between two or more local boards acting under this section, the decision thereon of the district council of their district shall be final.

16. (1) A district council may, from time to time, concur with any other district council or district councils, in appointing, out of their respective bodies, joint committees for any purpose in respect of which they are jointly interested, and in delegating to any such committee any power which might be exercised by any or either of the district councils, and in framing and modifying regulations as to the proceedings of any such joint committee.

Joint committee of two or more district councils.

(2) If any dispute arises between two or more district councils acting under this section, the decision thereon of the Chief Commissioner shall be final.

#### *Conduct of Business.*

17. (1) Every district council and local board shall, from time to time, elect one of its members to be chairman for one year at all meetings at which he is present.

Chairman.

(2) If the chairman so elected dies, resigns or becomes incapable of acting, the council or board shall elect another of its members to be chairman for the period during which the person so dying, resigning or becoming incapable would have been entitled to continue in office, and no longer.

(3) An election under the foregoing provisions of this section shall not be valid until it is approved, in the case of the chairman of a local board by the Commissioner of the division, and in the case of the chairman of a district council by the Chief Commissioner.

(4) If the chairman is absent from any meeting, the members present shall appoint one of their number to be chairman thereat.

18. (1) Every district council and local board may, from time to time, make regulations as to the time and place of its meetings, the conduct of proceedings at meetings, and the appointment, powers and proceedings of committees :

Regulations as to meetings and proceedings.



(2) Provided that every regulation made under this section must be consistent with this Act and with any rules made by the Chief Commissioner under this Act.

*Officers and Servants.*

19. (1) Every district council may employ and pay a clerk and such other officers and servants as may be necessary and proper for the efficient execution of its duties.

*Employment of officers and servants.*

(2) A local board may employ such officers and servants, if any, and may assign to them such reasonable remuneration, as the district council of its district thinks requisite and sufficient.

(3) In the case of an officer lent by the Government, the council or board may contribute to his pension and leave allowances in accordance with the rules for the time being in force.

(4) If, in the opinion of the Deputy Commissioner,

(a) the number of persons employed by a council or board under this section, or the remuneration assigned by the council or board to those persons, or to any particular person, is excessive, or

(b) any such person is unfit for his employment—

the council or board shall, on the requirement of the Deputy Commissioner, reduce the number or remuneration, or, as the case may be, dismiss the unfit person :

Provided that the council or board may appeal against any such requirement to the Chief Commissioner, whose decision shall be final.

*Vesting of Property.*

20. The Chief Commissioner may, from time to time, by notification in the official Gazette, direct that any property, moveable or immoveable, which is vested in Her Majesty and is situate in the Central Provinces, shall vest in any district council, and thereupon that property shall vest in that council for the purposes of this Act, subject to all debts, liabilities and obligations (if any) affecting that property.

*Power to vest property in district council.*

*Finance.*

21. (1) There shall be formed for each district a fund to be called the district fund, and there shall be placed to the credit thereof—

*Constitution, custody and application of district fund.*

(a) the net proceeds (after deducting the expenses of collection) of all rates levied under settlement-records in that district for the maintenance of roads, schools or the district post ;

(b) all sums assigned, from time to time, by the Chief Commissioner for expenditure on local works in that district, under section eighteen of the Cattle Trespass Act, 1871, section 5 of the Central Provinces Additional Rates Act, 1878, section seventeen of the Northern India Ferries Act, 1878, or any enactment amending any of those Acts ;

(c) all such rents and profits accruing from nazul property in that district as the Chief Commissioner may, from time to time, direct to be paid to the district council ;

(d) all sums contributed to the fund by the Government or private persons ; and

(e) all sums received by the district council, in the execution of this Act.

(2) The district fund shall be vested in the council and the balance standing to the credit of the fund shall be kept in the Government treasury of the district.

(3) The district fund shall be applied to payment, in whole or in part, of the charges and expenses incidental to the several matters specified in section nine and also to the following purposes :—

(a) the maintenance of the district post ;

- (b) the payment of school inspectors and normal school teachers appointed and controlled by Government and employed in the district, and the provision of scholarships and prizes for schools in the district ;
- (c) the payment of subordinate medical officers appointed by Government and employed in the district ; and
- (d) the expenses attending the audit of the accounts of the district council and of the local boards within the district.

(4) When a local board has been declared independent under section fourteen, such portion of the district fund as belongs to or accrues within the area under the board shall be set apart and placed at its disposal, and shall, for the purposes of this Act, be treated as a separate district fund.

Annual estimates of income and expenditure.

22. (1) Every district council shall appoint a finance committee consisting of not less than *three* of its number.

(2) Every district council shall, on or before the prescribed day in each year, hold a meeting at which the finance committee shall submit to the council an estimate of the income and expenditure of the council for the next financial year, in such form as the Chief Commissioner may, from time to time, by rule prescribe.

(3) The district council shall consider the estimate, and may provisionally approve of it with or without modification.

(4) The district council shall, on or before the prescribed day, cause copies of the estimate as provisionally approved by it to be sent to the Deputy Commissioner.

(5) If the Deputy Commissioner signifies in writing to the district council his disapproval of the estimate with respect to any proposed expenditure on salaries, works or otherwise, appearing to the Deputy Commissioner to be unnecessary or excessive, or with respect to any particular or particulars appearing to the Deputy Commissioner to be erroneous, defective or improper, the district council shall consider the matter and either modify the estimate or refer it through the Deputy Commissioner to the Chief Commissioner, whose decision shall be final.

(6) The district council shall, on or before the prescribed day in each year, hold a meeting for the purpose of further considering the estimate and any objections or suggestions which may have been made with respect thereto by the Deputy Commissioner or any other authority or person, and of finally approving the same with the modifications (if any) necessary under clause (5) of this section, and with any other modifications it may think expedient.

(7) "Prescribed day" for the purposes of this section means such day as the Chief Commissioner may, from time to time, by rule prescribe.

23. Accounts of the receipts and expenditure of every district council

Annual accounts and audit.

shall be made up to the last day of every financial year in such form as the Chief Commissioner, from time to time, prescribes, and shall be examined and audited as soon as may be after the end of each financial year by such persons as the Chief Commissioner, from time to time, appoints in this behalf.

24. The district council shall cause a copy of every estimate provisionally

Inspection of estimates and accounts.

or finally approved by it under this Act, and of every account made up under the last foregoing section, to be kept at their office ; and any rate-payer may at all reasonable times inspect any such estimate or account.

25. An abstract of every annual account of a district council, showing the

Publication of abstract of accounts.

income of the district fund under each head of receipts, the charges for establishment, the works undertaken, the sums expended on each work, and the balance, if any, of the fund remaining unspent, shall be prepared by the district council in such form as the Chief Commissioner, from time to time, prescribes, and published annually in the English and Vernacular local official Gazettes.



*Control.*

26. (1) The Deputy Commissioner of a district shall have power to supervise the proceedings of the district council and of every local board or joint committee for an area within the district, and in exercise of that power may (among other things)—

Deputy Commissioner's power of supervision.

- (a) enter on and inspect any immoveable property occupied by the council, board or committee, or any work in progress under its direction;
- (b) call for and inspect any document in the possession or under the control of the council, board or committee for the purposes of this Act; and
- (c) require the council, board or committee to furnish such statements, accounts and reports as he thinks fit.

(2) Where a joint committee is appointed by the district boards of several districts, the Deputy Commissioner of any of those districts may exercise a like power in respect of the proceedings of that committee; but if any difference arises between two or more Deputy Commissioners acting under this clause, it shall be referred to the Chief Commissioner, whose decision shall be final.

27. (1) If, in the opinion of the Deputy Commissioner, the execution of any order or resolution of a district council, local board or joint committee, or the doing of any act which is about to be done or is being done in pursuance of or under cover of this Act, is likely to cause injury or annoyance to the public, or to any class or body of persons, or to lead to a breach of the peace, he may, by order in writing, suspend the execution or prohibit the doing thereof within his district.

Power to suspend execution of orders, &c.

(2) When a Deputy Commissioner makes any order under this section, he shall forthwith forward to the Chief Commissioner, through the Commissioner, a copy of the order, with a statement of the reasons for making it, and it shall be in the discretion of the Chief Commissioner to rescind the order or to direct that it continue in force with or without modification, permanently or for such period as he thinks fit.

28. (1) When the Chief Commissioner is informed, on complaint made or otherwise, that a district council has made default in performing any duty imposed on it by or under this Act, the Chief Commissioner, if satisfied after due inquiry that the district council has been guilty of the alleged default, may, by an order in writing, fix a period for the performance of that duty.

Power to provide for performance of duties in default of district council.

(2) If that duty is not performed within the period so fixed, the Chief Commissioner may appoint some person to perform it, and may direct that the expense of performing it, with a reasonable remuneration to the person appointed to perform it, shall be forthwith paid by the district council.

(3) If the expense and remuneration are not so paid, the Chief Commissioner may issue a warrant directing the person having the custody of the balance of the district fund to pay the expense and remuneration, or as much thereof as is possible, from that balance.

29. (1) If a district council or local board persistently makes default in performance of the duties imposed on it by or under this Act or otherwise by law, or exceeds or abuses its powers, the Chief Commissioner may, with the previous approval of the Governor General in Council, by an order published, with the reasons for making it, in the official Gazette, declare the council or board to be in default, or to have exceeded or abused its powers, and supersede it for a period to be specified in the order.

Power to supersede council or board in case of default or of abuse of powers.

(2) When a district council or local board is so declared to be in default, or to have exceeded or abused its powers, the following consequences shall ensue:

- (a) All members of the council or board shall, as from the date of the order, vacate their offices as such members.
- (b) All powers and duties of the council or board may, during the period of supersession, be exercised and performed by such person or persons as the Chief Commissioner, from time to time, appoints in that behalf.

- (c) All property vested in the council shall, during the period of supersession, vest in Her Majesty.
- (d) On the expiration of the period specified in the order, the council or board shall be re-established by the appointment or election of new members.

*Rules.*

Power for Chief Commissioner to make rules as to district councils and local boards.

30. The Chief Commissioner may, from time to time, make, and alter, rules consistent with this Act—

- (a) as to the qualifications, mode and time of election or appointment, term of office, and remuneration and allowances (if any) of members of district councils and local boards;
- (b) as to the conduct of proceedings of district councils and local boards, including the fixing of a quorum, the formation of committees and the delegation of powers to such committees;
- (c) as to the appointment and payment of auditors of the accounts of district councils and local boards;
- (d) as to the apportionment of the district fund between the general purposes of the district and the purposes of particular parts of the district, and the appropriation of funds raised in a particular area to purposes of that area; and
- (e) generally, for the guidance of district councils, local boards and Government officers in all matters connected with the administration of this Act.

*Exceptional Provision.*

31. If the circumstances of any district or part of a district are, in the opinion of the Chief Commissioner, such that any of the provisions of this Act are inapplicable thereto, he may, by order, except the district or part from the operation of those provisions; and thereupon those provisions shall not apply to the excepted district or part until applied thereto by a subsequent order of the Chief Commissioner.

Power under special circumstances to except districts from operation of Act.

*Supplemental and Temporary Provisions.*

32. (1) All rates for the maintenance of roads, schools or the district post, for the payment of which provision has been made in any settlement-record previous to the passing of this Act, shall be deemed to have been legally imposed, and shall be recoverable as if they were arrears of land-revenue payable directly to Government and due on the land in respect of which they are payable.

Confirmation and recovery of existing rates.

(2) An account of the gross receipts and of the charges (if any) of collection of all such rates in each district shall be kept by the Deputy Commissioner of that district, and shall be annually rendered by him to the district council of that district.

Account of receipts and charges to be kept by Deputy Commissioner.

Powers of Chief Commissioner with respect to rates.

33. The Chief Commissioner may, from time to time, by notification in the official Gazette,

- (a) prescribe in what instalments, and at what times, the rates referred to in the last foregoing section shall be payable, and make rules for their collection by village-officers or others; and
- (b) exempt any land from liability to pay the whole or any part of any such rate, and vary or cancel any such exemption.

34. If any member, officer or servant of a district council, local board or joint committee appointed under this Act is directly or indirectly interested in any contract made with that council, board or committee, he shall be deemed to have committed an offence under the Indian Penal Code, section 168.

Penalty on member, officer or servant being interested in contracts made with council, board or committee.

35. All rules and orders made by the Chief Commissioner under this Act shall be published in the local official Gazette.

Publication of rules and orders.



36. The several district councils and local boards under this Act shall come into existence at such time as the Chief Commissioner, by order, appoints in that behalf.

37. Nothing in, or done under, this Act shall prejudicially affect the rights of any officer appointed before the passing of this Act, as to tenure of office, salary or pension.

No. 3712, dated the 29th September, 1882.

From—L. FRASER, Esq., Offg. Secy. to the Chief Commissioner, Central Provinces,  
To—The Secretary to the Government of India, Legislative Department.

I AM directed to acknowledge receipt of your letter No. 810, dated 15th July last, forwarding, for the opinion of the Chief Commissioner and of all Commissioners and Deputy Commissioners in this Province, a "provisional draft of a Bill to make better provision for local self-government in the Central Provinces." I am accordingly to forward copies of letters received from all Commissioners and Deputy Commissioners giving expression to their opinions on the Bill: these are grouped together according to the Revenue Divisions from which they have been written. The Deputy Commissioners of Nágpur, Hoshangábád and Narsinghpur have also been called on to work out on paper for their districts the scheme contemplated by the Bill. This has been done for these districts and for the district of Wardha; and a copy of all the papers bearing on this exemplification of the probable working of the proposed Act is also appended for the information of Government.

2. I am now to submit the following observations by the Chief Commissioner on the proposed Bill. In accordance with the direction contained in the third paragraph of your letter under reply, these remarks will deal with the substance of the measure rather than the wording or form of the Bill. In the first place, then, I am to say that the Chief Commissioner cordially accepts the principles on which this Bill is based, and heartily concurs in the desire of the Government of India to do all that can be done to extend self-government "as an instrument of political and popular education." This is a subject in which he has taken considerable interest in the past, although the sphere of operation has been very limited.

3. District fund committees have hitherto been little more than bodies of respectable native gentlemen with whom the Deputy Commissioner and other local officers might take counsel for the public good. They have been assembled at head-quarters and have not been in any way representative of the district generally; but their main use has been as exponents of Native opinion in regard to measures which the local officers have had under contemplation. With Municipal Committees the case has been very different. The system of appointment of members of these Committees by election has now been in operation for years: it is now the system generally followed. In many places it is, of course, more or less of a farce; but in some it is very far from being so. The members of some municipalities, duly elected by the people themselves, are distinctly representative: that is, they represent their constituents in ideas, caste and local interests. They are elected for this purpose; and they carry it out.

4. The position of member of Committee is now looked on as one of some importance: a curious illustration of this has only recently occurred, in the presentation to the Chief Commissioner of a numerous signed petition impugning the fairness of the election of a member for a ward in the city of Nágpur. Further, considerable interest in the work of the Committee has been evinced by its members in some municipalities. In the last Administration Report (1880-81) the Chief Commissioner was able to write (p. 61):—"The Divisional reports attest the existence in many municipalities of a keen interest which extends in some to the supervision of much executive work. The Nágpur divisional report is silent on this subject, but the district reports confirm the opinion already formed by the Chief Commissioner, that the elective body of Nágpur, Wardha, and Hinganghát take a prominent part in municipal matters. The three municipalities of the Chhattísgarh Division are administered by Committees, the Native members of which understand and appreciate their share of power and responsi-

bility. This was specially illustrated during the year in the town of Bilaspur. In the Jabalpur division, the Committees which meet most regularly and exercise a real control over municipal expenditure are those of Jabalpur, Murwara, Seoni and Mandla. It is in certain municipalities of the Narbada Division that the zeal and energy of municipal elected members is most favourably mentioned. Thus in the Hárda Municipality each member has continued to perform special duties for which he is specially responsible, and conservancy and water-supply, education and public works, are mentioned as branches of municipal administration which have thus been especially supervised. In Hoshangábád and Burhanpur also this system of distribution of work exists."

5. A further step can now be recorded in the Hárda municipality: the duties of Secretary are performed by each member in turn in monthly rotation. This shows how experienced they have become in Municipal administration, and the real assistance that may be expected from men like them. Some time ago the Chief Commissioner expressed his desire to remove all officials from the membership of Municipal Committees wherever such a measure could be safely introduced at once. The Commissioner of the Narbada Division promptly recorded his opinion that the election by certain Committees of their own Presidents and Vice-Presidents, and the removal from them of the official element, would be a perfectly safe measure and attended with many advantages. The Commissioners of the Jabalpur and Chhattísgarh Divisions also expressed their belief that the measure might be tentatively introduced in certain municipalities with very good hope of its proving successful. The Commissioner of the Nágpur Division did not report so favourably on the subject; but the Chief Commissioner believes that the measure may be tried in a few of the municipalities of that division also. He is having the experiment tried in selected municipalities throughout the province.

6. All this is mentioned here not only to show that some measures have been already adopted in a comparatively small way to educate the people in self-government, and to inculcate a spirit of self-reliance among them, but also to show that these measures have been very fairly successful. The success that has been achieved in this comparatively narrow sphere goes very far, in the opinion of the Chief Commissioner, to show that much of the pessimist opposition to the far more extensive and bolder policy now inaugurated is founded on prejudice, and on ignorance of the capacity of the Natives of this country to meet responsibility when they find that it really rests upon them. The Chief Commissioner admits freely that in few, if any, parts of this Province will self-government be introduced without the possibility of very serious blunders at first, and the necessity for anxious watchfulness for some time to come; but he is strongly of opinion that there is little or no advantage in delaying the initiation of this policy. Let such a system as is sketched in the Bill be introduced prudently and gradually; let its operation be anxiously watched but not unduly interfered with; let the spirit of self-reliance and self-respect be carefully fostered,—and the Chief Commissioner is convinced, from such experiences as are recorded above, that this policy will prove an efficient "instrument of political and popular education." To delay the initiation of a policy of education is only to prolong the period of incapacity.

7. Turning now to the consideration of the Bill itself, I am to devote special attention to the points enumerated in the fourth paragraph of your letter under reply. *First*, then, as to the formation of the local administrative areas, the Chief Commissioner is of opinion that the village should be taken as the basis of the scheme, and that this fact should be clearly laid down by law. The executive headman, or mukaddam, resident as he must be (section 137 of the Central Provinces Land-revenue Act, 1881) in the village, may not always be in full accord with all the raiyats, but is undoubtedly as a rule the best representative of the village interests: he is therefore best fitted to give his vote for, or serve as, a member of the Local Board. And the principle that every village should be more or less directly represented is one which forms so much the essence of the policy now projected, that it should, in the Chief Commissioner's opinion, find its place in the law which enunciates that policy.

8. In respect to the formation of circles and groups, the Chief Commissioner holds undoubtedly that regard should be had (section 3, clause 2) "to the community of interest for purposes of this Act between the several villages



comprised in them"; but he is doubtful of the expediency of laying this down in the law. It is enough to prescribe (as is done in section 3, clause 1) that the Chief Commissioner shall form these circles and groups: it is clear that he must do this on some principle; and the principle suggested in the draft Bill is the principle he would undoubtedly follow, as far as possible. There is no real advantage, therefore, in prescribing it, and it might lead to complications and unnecessary difficulties. The formation of the circles and groups by the Deputy Commissioners of Hoshangábád and Nágpur in the schemes appended to this letter has been conducted, in the case of the former district, by adopting the old sub-divisions wherever possible, and in the case of the latter, by adopting the present police circles. In both cases, divisions already well known to the people, and originally made from considerations of community of interest and of administrative expediency, have been rightly adopted. But cavilling objection might no doubt easily be taken in the case of individual villages to their inclusion within the limits of any particular circle or group. It is well, the Chief Commissioner thinks, to formulate the principles and character of the system projected, but not to tie the hands of local officers too tightly in regard to the working out of details.

9. *Secondly*, the Chief Commissioner considers that the provisions regarding the constitution of the local administrative bodies, contained in the proposed Bill, are suitable, and that they should be formulated in the law. He considers that the chief element of the Local Board should be the representatives of the village circles; that the mercantile classes should also be represented, and that, when and so long as there is need, a small proportion of the members should be appointed by the Chief Commissioner himself. He considers that all this should be laid down in the law; but that details regarding the method of the election and appointment of members should be left to the rules to be framed under the law. For his own part, the Chief Commissioner believes very strongly in the possibility of educating the people up to a full appreciation and a ready exercise of the privilege of election. In most parts of the Province, indifference must be expected for some time to come; but the progress that the system of popular election has made in some municipal towns shows that this indifference would soon yield before patient and earnest efforts to foster a spirit of self-reliance and self-help.

10. *Thirdly*, the relations of Local Boards to each other and to the District Council fall to be considered. The subordination of the Local Boards to the District Council is rightly the normal constitution contemplated by the draft Bill; and the Chief Commissioner believes that the case would very rarely indeed occur, when it would be expedient to exercise the powers conferred on him by section 14, and declare a Local Board independent of the Council. The Chief Commissioner, however, is of opinion that the functions of the District Council should mainly consist in deliberation and control, and that executive functions should chiefly belong to the Local Boards. If both have executive functions there may be friction; and the very constitution of the District Council renders it rather an unsuitable executive body. It would tend to the further extension of the scheme of self-government, and to the further development of those qualities which it is meant to foster, were executive functions mainly to belong to the Local Boards. Besides this, if the District Council had simply to deliberate on broad questions of income and expenditure, to initiate schemes for the public advantage, to exercise general supervision and control over the work of the Local Boards, and to perform other duties of a similar character, its meetings would not require to be very frequent; and there might be some hope of their being fairly well attended by members from a distance. The Chief Commissioner would suggest for consideration how far this view of the matter might be embodied in the proposed legislation. It seems anomalous that the subordinate Boards should have no possible relation to the District Council, except either complete subordination within the same sphere of executive duties or complete independence. The Chief Commissioner would rather see the Local Boards realising full responsibility to the District Council but exercising full independence in regard to executive details. I am to add that the Chief Commissioner considers that it is quite necessary to confer on him the power of withdrawing the independence granted by him to any Local Board under section 14.

11. *Fourthly*, with regard to the conduct of business, the provisions of the Bill have the Chief Commissioner's approval. Perhaps the most important points in connection with this part of the subject is the appointment of chairman to any of these local bodies. This is to be made by election. All the part in the matter to be taken by Government is that the approval of the Commissioner is required in the case of the Local Board, and that of the Chief Commissioner in the case of a District Council, to give validity to such an election. The Chief Commissioner desires no further discretion. There can be little doubt that when a high official sits as member in any of those local bodies, it is fitting that he should preside; but there can be equally little doubt that so long as that body is weak enough to require his presence, it will desire that he should preside. And the normal state of matters ought to be that the members should themselves choose the gentlemen who is to preside over their deliberations. All that the Chief Commissioner would desire is the power in case of necessity to veto any unworthy or unwise appointment: this is reserved to him in the Bill as drafted. I am here to say also that the Chief Commissioner thinks that the Bill rightly gives to him, and not to an officer of inferior position, the power to approve of the appointment of a chairman of the District Council; for it will add dignity to that appointment to have its approval notified in the Local Gazette.

12. *Fifthly*, the Chief Commissioner has nothing to add to the list of duties to be performed by these local bodies. He would observe, however, that the management of pounds and ferries is mentioned in the eleventh paragraph of your letter under reply as a matter which "should certainly form part of the business of the Local Boards." But it is not mentioned in section 9 of the Act. The Chief Commissioner would certainly include this among the duties of the Boards. There are several other duties which he thinks they may often show themselves most capable of performing, and which are indicated in the letters of some Deputy Commissioners; but the performance of these it will be best to request as a favour from the local bodies fit to perform them than to prescribe by legal enactment for all.

13. *Sixthly*, the subject of control has received careful consideration from the Chief Commissioner; and he is perfectly satisfied with the provisions of the draft Bill. The object being, as it is, to foster self-reliance and self-help, constant interference and dictation must be deprecated. The power to be reserved is that of general supervision and of occasional check: this is done in the sections of the Bill bearing on the subject.

Under the power vested in him in section 5 (c), the Chief Commissioner might appoint officials to be members of the local bodies so long as their presence there was necessary. But the object to be kept in view is to separate completely between the functions of district officers and those of the local bodies; and as soon as any local body showed capacity for independence the official element would be removed. Assistance would no doubt always be given in the way of unofficial advice and suggestions to members of the local bodies, so as to enable them to perform their duties more successfully and efficiently. But the sooner official interference is limited in the manner indicated in the Bill, the better. Even at the first, it would probably be found necessary in very few cases indeed to have the Deputy Commissioner a member of the Board or Council. His subordinates might necessarily at first be there; but his own influence might be exercised from without, in the manner contemplated by the Bill, from the very outset. Under no other plan would the powers and responsibilities of these bodies be real. The plan thus formulated in the Bill commends itself to the Chief Commissioner as enabling Government to exercise all necessary control.

14. *Seventhly*, the heads of income assigned to the District Fund under section 21 are explicit and full enough, except that there is no clear provision under clause 1 (d) for voluntary grants from Municipalities. Such grants are pretty frequently made with very good cause to the District Funds to assist in the execution of works in which the Municipality is interested. There are small funds not mentioned in this section, but indicated by some Deputy Commissioners in their letters hereto appended, which might be made over to District Funds. But these would be better made over by the Local Govern-



ment on its own motion; and this is provided for by clause 1 (d). All that it is necessary to enact by law in this respect seems to the Chief Commissioner to be included in section 21 of the Bill.

15. *Eighthly*, the very important question, whether any, or what, powers should be taken of raising rates for local purposes, now falls to be considered. The Chief Commissioner admits at once that one of the greatest difficulties in the way of making this measure a practical success is the want of funds. This is shown in the reports of the Deputy Commissioners of Hoshangábád and Nágpur on the manner in which the scheme contained in the Bill would be applied to their districts. The funds properly belonging to any one district would hardly stand division among several Local Boards; but these funds would of course be considerably supplemented by grants from Provincial Revenues and from other sources. Still the want of funds would be felt as soon as work was earnestly taken up. The necessity for raising increased funds would pretty soon become apparent; and the propriety of allowing the District Council to raise funds, or at all events to point out the need and suggest the means of meeting it by taxation as is now done by municipalities, seems to the Chief Commissioner unquestionable. But he would not advocate any provisions being contained in the present Bill for this purpose. At the outset, such provisions might be viewed with suspicion; and the whole scheme might only be regarded as an elaborate attempt to increase taxation without attracting much attention. It would be better to wait until the scheme had vindicated itself a little, and until the need for increased taxation was felt. The introduction of such provisions then would not only not throw odium on the scheme of self-government, but might even tend to popularize taxation.

16. *Ninthly*, the appropriation of funds to special works or to the requirements of certain local areas would best be regulated by rules to be framed under section 30. It is difficult to formulate in the law principles which would sufficiently regulate this appropriation without too much limiting discretion in individual cases. The general principle would be, in the Chief Commissioner's opinion, that money raised within any local area ought ordinarily to be expended within that area by the body vested with local control. But the charges incurred in the performance of the duties of the District Council would have to be met from the general funds of the district; and the execution of works affecting the district as a whole, or more than one sub-division, would necessitate power to allocate funds within certain limits being vested in the District Council. It would probably be found enough to provide generally in the Bill that funds could not be diverted from the control of the Local Board within whose area they were collected without the sanction of the Chief Commissioner, all details being left to the rules. It is doubtful whether even this provision is required.

17. *Tenthly*, the question of the grant of allowances to members of Local Boards and District Councils has been raised. The Chief Commissioner is of opinion that it would be well to remunerate them, (1) because it would tend to make the office of member more popular, and (2) because it would establish a claim on the energetic services of the members which they would thoroughly understand.

The Chief Commissioner does not think that the remuneration granted to mukaddams under the Central Provinces Revenue Act, 1881, should be held to cover the performance of the duties of member of a Local Board also. For these are special duties. A small remuneration, in the coveted form perhaps of a remission of revenue on a limited portion of his *sér*-land, or of the land in his cultivation, might be made to any mukaddam serving on a Local Board. The Chief Commissioner believes that it is proposed to give honorary titles to members of the District Council: this would be sufficient remuneration in their case, and it might perhaps be confined to the Chairman and Vice-Chairman. But the Chief Commissioner would propose that power should also be given to him to include in the rules framed under section 30 a rule to provide for the payment by the District Council of travelling allowance at certain rates to any member coming from a distance who should apply for it.

18. In concluding your letter under reply, you refer the Chief Commissioner to two points. "*First*, no definite position has been assigned to the

Commissioner of Division in the draft." The Chief Commissioner concurs with your observations regarding the difficulty of giving that officer any definite functions, but does not think it well to leave his position to be settled on the basis of a vague understanding. The fact that certain functions are expressly given to the Commissioner in the Bill, (*e.g.*) section 17 (3), will probably be held by implication to exclude him from the performance of others, unless they also are provided for. It might be enough to enact that the Commissioner shall exercise the same authority and control over Deputy Commissioners in the discharge of their duties under this Act, as he exercises over them in the ordinary revenue-administration of the country. Or the matter might be mentioned as one to be provided for by the rules to be framed under section 30. In any case, all mention of it should not be omitted.

19. "*Secondly*, it is thought possible that the Act may be inapplicable to some of the wilder parts of the Central Provinces"; and section 31 accordingly gives power of excepting any district or portion of a district from its provisions, if necessary. The exercise of this power will certainly be required; it is right, therefore, that the power should be reserved; and the Chief Commissioner thinks that this will be sufficient to meet the requirements of the case.

20. The Chief Commissioner has now followed you through your letter under reply and has discussed the main provisions of the Bill. It meets with his general approval; and he will lend his most cordial assistance in carrying out any such measure. He has very little, if any, sympathy with the view that the development of a spirit of self-reliance and of a power of self-government among the people of India would be a dangerous measure. On the contrary, he hopes and believes that it would interest leading and influential men in the stability of institutions in which they would play a real and honourable part.

21. Neither does the Chief Commissioner believe that this boon will not be appreciated by the people. There is no doubt that such views as are quoted by the Commissioner of the Nagpur Division are held by some members of the Native community. But this is due, in the first place, to misconception of the object and terms of the measure, as is seen from the Commissioner's own remarks; and, in the second place, to the very want of that political education which this measure is intended to afford. I am to add that the views quoted in that letter are not the views generally held by the majority of Natives of education and position. The public of Nagpur, though this is the seat of the Local Government, is not representative of the best thought and spirit of the Central Provinces. The influence of the corrupt and effeminate Native Court has been very demoralizing. The Chief Commissioner therefore does not regard the views quoted by the Commissioner as being representative of enlightened Native opinion throughout the Province. He believes that this Bill will generally be received as a boon, and as the proof of confidence in the people and regard for their interests on the part of Government.

22. It would be unwise at once to thrust self-government in all its fulness on a people unaccustomed to its exercise. But the Bill does not necessitate this. The areas under Local Boards would be as small as possible, so as to secure both local knowledge and local interest on the part of the members; but they need not be made too small at first. When funds increase and capable men become more common, they could be further reduced in extent. But a beginning could at once be made in decentralization. Similarly, appointment of members by election may have to be gradually introduced; and the appreciation of the privilege may want fostering; but all this is possible under the terms of the Bill. Again, the withdrawal of the official element at once may not be possible in most cases. But the Bill provides for this being gradually done. In a word, the Bill contains provisions for a scheme of complete self-government; but it also contains provision for the gradual education of a backward people up to that scheme. The Government of India may rest assured that, should such a measure as this Bill become law, it will be patiently and carefully, but also boldly and loyally, applied; and the Chief Commissioner is persuaded that he will have the cordial co-operation of all local officers in carrying out the aims of Government.

D. FITZPATRICK,

*Secretary to the Government of India.*





SUPPLEMENT TO  
**The Gazette of India.**

N<sup>o</sup> 46. } CALCUTTA, SATURDAY, NOVEMBER 18, 1882.

OFFICIAL PAPERS.

*A SUPPLEMENT to the GAZETTE OF INDIA will be published from time to time, containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

*Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or nine Rupees if sent by Post.*

*No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA is required by Law, or which it has been customary to publish in the CALCUTTA GAZETTE, will be included in the SUPPLEMENT. For such Orders and Notifications the body of the GAZETTE must be looked to.*

GOVERNMENT OF INDIA.  
PUBLIC WORKS DEPARTMENT.

Railway Construction.

REPORTS ON THE RECONNAISSANCES FOR A RAILWAY BETWEEN VIZAGAPATAM AND RAIPUR.

No. 966 R.-C., dated Simla, 2nd November 1882.

RESOLUTION—By the Government of India, Public Works Department.

READ the following papers :—

- (1) Reports on the reconnaissances lately made under the orders of the Government of Madras for a railway between Vizagapatam and Raipur.
- (2) Letter from the Government of Madras, Public Works Department, No. 2367 W., dated 30th September 1882, and note by Consulting Engineer for Railways, Madras.
- (3) Letter from the Government of Madras, Public Works Department, No. 2682 W., dated 16th October 1882.
- (4) Extract from a letter, No. 943 R.-C., dated 27th October 1882, from the Government of India, to the Government of Madras, Public Works Department.
- (5) Index.

ORDER.—Ordered, that this correspondence be published in the Supplement to the *Gazette of India* for information.

By order,  
W. S. TREVOR, Colonel, R.E.,  
Secretary.

No. 2366 W., dated 13th September 1882.

RESOLUTION—By the Government of Madras, Public Works Department.

READ the following papers:—

Letter from Mr. Nordmann, dated 16th November 1881, No. 14 R.

Letter from Chief Commissioner, Central Provinces, Public Works Department, dated 16th November 1881, No. 9059.

Letter from Mr. Nordmann, dated 26th November 1881, No. 19 O.

" " " 4th December " " 20 B.

" " " 6th January 1882, " 24 R.

" " " 14th " " 27 R.

" " " 25th February " " 38 K.

" " " 30th March " " 60 W.

" " " 14th April " " 72 W.

" " " 18th " " 74 W.

## I.

## INTRODUCTION.

*Preparations for the Expedition.*—In the Council held at Stonehouse, Ootacamund, on the 8th September 1881, which I had been asked to attend, it was settled that I should undertake the reconnaissance, and that Mr. Sub-Engineer Cormac should be attached to the party as my Assistant. Shortly afterwards I was supplied with maps and other information, while in G. O., No. 2294 W., dated 16th September, instructions were issued for my guidance.

2. *Tents and Stores.*—Tents were telegraphed for by the Secretary to Government in the Public Works Department, all over India; but time pressing, they could not be supplied sufficiently early for the expedition.

The Quartermaster-General's Department was indented on for tents, and it was believed that department would furnish the required number; but at the last moment it declined to supply any tents, as all available canvas—so it was stated—would be required for the troops to move into camp, in case cholera, which was flying about, should break out seriously at one or more military stations. I was therefore directed to procure what tents I required from those available at the Central Jails of Coimbatore and Vellore. Accordingly I left Coonoor on the 9th October, and proceeded first to Coimbatore and then to Vellore, where I selected such tents as seemed most suitable for the purpose in view, namely, combining lightness in weight with due protection from sun and rain, and reasonable comfort.

3. I had been decided that two complete sets of tents should be supplied for the expedition, so that one set should always be a day's march ahead, both in order to secure expedition in movement and a good sanitary condition of the party.

4. The number of tents selected—twenty—at first sight seems large; but it has to be borne in mind that two sets of tents were provided for every purpose, namely, one set for to-day's and one for to-morrow's camp; so that no one in camp should at any time be without shelter. This precaution was the more necessary, seeing that the expedition started in the face of the impending north-east monsoon and had to march through a country which has not the best reputation in the matter of malarious fever and its accompaniments.

5. The tents selected were—

(1) *For the Executive Engineer and his Assistant.*

	lbs.	lbs.
2 Bengal Sleeping Pals 12' x 12', each weighing	222	444
1 Hill tent 12' x 12', weighing	300	
1 Bath-room for do	30	
1 Double-fly Bechoba 11' x 11'	220	
1 Bath-room for do	30	580

(2) *For the Hospital Assistant and the Writer.*

1 Single-fly Bechoba 10' x 10'	135	
1 Rowty 9' x 12'	93	228



(3) *For the Revenue Subordinate.*

	lbs.	lbs.
2 Cabul Páls 6' x 7' . . . . .	80	=160

(4) *For the Police Guard, Stores and Baggage.*

2 French "tentes de troupe" 18' x 14' . . . . .	90	=180
---	----	------

(5) *For Lascars and other Camp-followers.*

6 Cabul Páls 7' x 8' . . . . .	80	=480
(6)—1 Small Sholdari for cooking in bad weather . . . . .	55	=55
(7)—1 Necessary Tent . . . . .	30	=30
(8)—2 Camp tents 7' x 6' for sundry purposes . . . . .	60	=20

Total 20 tents, weighing=lbs. 2,277.

NOTE.—Two of each kind of Nos. 6 and 7 were not available at short notice.

6. The tents having been selected, there was a further week's delay in Madras, since all the tents could not be got ready for shipment by the British India steamer of the 13th October to Vizagapatam. This week was utilized by me in Madras in seeing the heads of the Government Departments concerned and ensuring the timely despatch of all the stores, scientific instruments, &c., that had been ordered to be supplied. Some of these had been already sent on by the steamer of the 7th. On the day (20th October) when I embarked at Madras for Vizagapatam, some of the tents from the Vellore Central Jail had not arrived at Madras.

For these I had to wait a week at Vizagapatam, where I arrived on the 23rd.

7. The week at Vizagapatam was made use of in unpacking, examining and repacking the tools, stores, instruments, &c., supplied; in pitching the new tents and making pegs for them (as most of the tents had come without pegs); in engaging a crew of tent lascars; observing aneroid, studying the maps, &c. I also conferred with the Master Attendant about the aneroid readings at sea level which are to be daily sent to me in camp for ascertaining altitudes in the country traversed.

8. There was a burst of the north-east monsoon and somewhat heavy rain at Vizagapatam on the 31st October and 1st November, after which the weather cleared up.

I left Vizagapatam for Vizianagarum on the 2nd November.

9. *The tract of country between Vizagapatam and Párvatipuram* was not reconnoitred, as it is well known to the Department of Public Works officers, and the levels are all on record.

This portion was therefore dawked over.

10. At Vizianagarum, which is 184 feet above sea level, I saw the Acting Agent, who gave me some useful information about such parts of the Jeypur country as are personally known to him; also His Highness the Maharajah, who seemed greatly interested in the success of the project and kindly lent me four of his elephants to carry tents and other camp equipage all the way to Raipur and back.

11. From Vizianagarum I telegraphed to the Secretary to the Commissioner of the Central Provinces, giving him my proposed route with the probable dates of arrival at places, and asked him to instruct the Rajah of Kálahundy and the Zemindars of Patna, Kariál and others to attach some responsible person to my camp to aid in procuring guides, camp supplies, coolies, &c.

12. I left Vizianagarum for Párvatipuram on the 7th November; the height of the latter place above sea level was ascertained to be 395 feet.

13. *From Párvatipuram to Ryaguddah.*—On the 12th November the reconnoitring party started on its march from Párvatipuram to Ryaguddah, one camp having been sent ahead the previous day. On the 12th began the regular reconnaissance, the taking of measurements, observations, notes, &c. The weather had been fine hitherto; but now there were signs of impending rain.

14. The whole camp train consisted of 20 tents as before specified,

4 Elephants for carrying tents, &c.,

12 Attendants on do.,

- 40 Pack bullocks for carrying small tents, stores, medicines, instruments, camp equipage, baggage, &c.,
- 13 Men, attending bullocks,
- 10 Bullocks to carry food and kit of the bullock men,
- 3 Men attending on these bullocks,
- 1 Hospital Assistant,
- 1 Hospital servant,
- 1 Camp Writer,
- 18 Lascars,
- 6 Private servants,
- 3 Ponies,
- 3 Horse-keepers,
- 3 Grass-cutters ;

Total 61 men, with 20 tents, 4 elephants, 50 pack-bullocks and 3 ponies; besides a daily varying number of coolies to carry instruments and sundries, and sometimes to relieve or assist elephants or bullocks in case of need ; or carry the improvised dhoolies.

15. The Dewán to His Highness the Maharajah of Vizianagarum had informed me that the elephants—which were not large ones—should not carry more than 500 lbs. each. However, to this the mahouts generally objected on the journey, on the plea of the elephants being sick and sore, which they not unfrequently were. Two additional elephants were kindly lent to the party for a time, one by the Rajah of Bisemkattak, the other by the Manager of the Bindra Noagarh Estate.

But even with this assistance a number of tents and nearly all stores and baggage had to be carried by bullocks.

The elephants, in addition to the tents, had to carry some of the mahouts and their kit, and generally a number of sick camp followers who were unable to march.

16. The pack bullocks were engaged for the whole journey from Párvatipuram to Raipur and back. This proved a very effective arrangement, as thereby a certain amount of carriage could always be depended upon ; while if we had relied upon coolies only, we should in many places have been unable to obtain the number required, and thus the party would have been delayed in the jungles.

WALTAIR,  
18th April 1882.

K. F. NORDMANN,  
*Executive Engineer.*

## II.

No. 14-R, dated Ryaguddah, 16th November 1881.

From—K. F. NORDMANN, Esq., Executive Engineer on Special Duty,

To—Colonel R. H. SANKEY, C.B., R E., Secy. to Govt., Public Works Dept., Madras.

In continuation of my letter No. 12-P, of the 12th instant, I have the honor to report that the reconnoitring party left Párvatipuram on the 12th and arrived at Ryaguddah,\* a distance of 30 miles and 6 furlongs, on the 14th instant, having satisfactorily attended to all necessary measurements, observations, the taking of notes, &c.

2. The weather, which had been fine up to the 12th, assumed a monsoonish appearance on the night of that date. It was cloudy on the 13th and 14th, with slight drizzling rain ; yesterday, the 15th, the clouds gathered in a threatening manner ; there was a heavy shower in the afternoon, and steady and continuous rain last night.

3. The track, which is passable for carts in the dry weather, from Párvatipuram to this, crosses the Narrainputnum river in the seventh mile, and then enters the valley of the Nágavully (or Chicacole) river, in which it runs up to Ryaguddah, keeping always within half a mile or so of the river bank. On both sides of the track are low ridges of hills. The valley is from one to three miles wide. The track is almost level, the longitudinal slope of the valley being very gradual.

\* Distance of Ryaguddah from Vizagapatam 116 miles and 6 furlongs.



4. The cross section is mostly flat; in some places the ground is undulating and cut up by ravines and large gullies caused by erosion, but generally it is level or nearly so. There is very little rock, and there are no difficulties in the way of a road or railway.

5. The soil, as a rule, is very fertile, though frequently of a light description. There is a good deal of jungle along the track, but less jungle than cultivation. The latter consists chiefly of dry crops, and there is also some paddy and sugarcane.

6. Villages are about a mile apart, and, on the whole, the country is sparsely populated; there is room for a greater population.

7. The hill ridges limiting the valley of the river are well wooded with trees and shrubs, and patches of cultivation are to be seen on the hill sides. The ippa tree grows here, besides tamarind, mango, jack, mathi, black wood, yégi, cashewnut, acacias, &c.

<p>8. The dry-crops consist of six different oil seeds (as per margin); three</p> <p>Gingelly. Two kinds of lamp oil. Castor oil. Oil from mustard seed. Oil from the ippa tree seeds.</p>	<p>fibrous plants (ganja or Indian hemp and two kinds of flax); cholum, maize or Indian-corn, horse-gram, green-gram, ragi, combu, and three or four other kinds of food grains (gantalu sámalu údalu, and korralu).</p>
--	--

9. Of vegetables, the people cultivate yam, pumpkin, cucumber, water-melon, plantain, brinjal, bhirkai, bendakhai (hybis-cus), &c.; tobacco is also largely grown.

10. Of minerals, there are kunkur, limestone and iron ore. The ore is smelted at Jummadahpettah, 10 miles south of Ryaguddah. Along the whole route there is kunkur limestone to be found, and suitable clay for brick-making. Building-stone will have to be quarried in the parallel hill ridges confining the valley of the river. The prevailing rock is gneiss, frequently studded with patches of quartz, and sometimes with red garnets.

11. The traffic I met is chiefly carried on bullocks. I saw paddy and hides coming from Ryaguddah, Bengal gram from Kálahundy, rice from Sumbulpoor; all going to Párvatipuram.

12. The Ooria people and language begin about 8 miles north of Párvatipuram.—There are some Khónd villages.

13. The drainage encountered between Párvatipuram and Ryaguddah is of an ordinary description; the large streams to be bridged are the Narrainputnum river in the seventh mile, 250 feet wide and 14 feet deep in flood; a stream in the sixteenth mile, 150 feet wide and 5 feet deep; and the river near Ryaguddah, 425 feet wide with a maximum depth of 22 feet.—The streams, as a rule, have sandy or gravelly beds; no rock for foundations, except in one or two cases, being visible near the crossings. There is a good rocky bridge site for the Ryaguddah river.

14. I am preparing a continuous section of the country as I march along, which will be accompanied by a narrative descriptive of all prominent features and of the particular heads alluded to in paragraph 12 of G. O., No. 2294 W., dated 16th September last, as well as by sections of large streams.

15. The height of Párvatipuram above sea level is 395 feet; that of Ryaguddah I have not yet been able to calculate accurately, as the last aneroid readings from Vizagapatam have not yet reached this.\* The aneroid here reads on an average 29·35, showing Ryaguddah to be about 700 feet above sea level.

\* Just received; altitude 687 feet.

16. I have not got the maps (scale one mile to the inch) of the country between Párvatipuram and Ryaguddah.

17. The health in camp has so far been good, except that the Hospital Assistant and the Writer have had a slight attack of fever.

18. The Revenue subordinate (paragraph 15 of the above quoted Government Order) has not yet joined my camp; it having been found difficult to engage a suitable man willing to go, and able to speak English, Telugu, Ooriya, and Hindustani; I have this day written to the Agent to the Governor at Vizagapatam and requested him to endeavour to supply a man with all or most of the qualifications named.

19. I leave this to-morrow for Bisemkattak, Ombadôla, Asurgor and Bôgor; while Mr. Cormac marches *viâ* Singapore to Bondesor, and thence to Dádpur and Bôgor. We propose to meet first at Lonjigar, to complete the section of the line from Singapore to Ombadôla; and then at Bôgor, where I expect to be about the 1st proximo.

20. I shall thank you to inform me whether it is desired that I should march from Jalbal (seven miles south-east of Nára) northwards to *Onki* about 20 miles, and back. If I do not hear from you about this in time, I shall make this march.

21. I request that two fresh perambulators may be sent for me to Raipur, to await my arrival there, as my perambulators shew signs of weakness and may be out of order and unserviceable by the time I arrive at Raipur.

22. I beg that letters may, till further notice, be addressed to "Ryaguddah, care of Sub-Magistrate, to be forwarded."

### III.

No. 9059, dated Nagpur, 16th November 1881.

From—The Secretary to the Chief Commissioner, Public Works Dept., Central Provinces,  
To—The Secretary to the Government of Madras, Public Works Department.

I am desired by the Chief Commissioner to forward, for the consideration of the Madras Government, the accompanying copy of letter No. 6812, dated 10th instant, from Commissioner, Chattisgarh Division (with enclosures), with reference to the reconnaissance, ordered by the Government of India, of the country between Vizagapatam and Raipur for a line of railway.

### IV.

No. 6812, dated 10th November 1881.

From—Colonel C. B. LUCIE SMITH, Commissioner, Chattisgarh Division,  
To—The Secretary to the Chief Commissioner, Public Works Dept., Central Provinces.

I have the honor to acknowledge the receipt of your letter, No. 7084, dated 1st September last, with its enclosures, and to say, after careful inquiry, that the project of taking the Vizagapatam-and-Raipur Railway west of the Mahánadi is doubtless feasible, but appears hardly advisable; because such a line must necessarily pass through a stretch of difficult country in the feudatory State of Kankér, which would entail a cost of construction that would probably more than counterbalance the gain obtained by avoiding the Mahánadi, while the line would lie altogether apart from the existing trade route.

2. The natural line I should judge to be that followed at present by the Brinjári traffic from Vizagapatam, which passes through Parvatipuram, Koontipenta, and Singapore, and crosses the Kálahundy border, 24 miles, as the crow flies, S.S.E. of Bhavánipatnam (called "Bondesor" on the maps). In this distance of 24 miles the only obstacle is the Músa ghât, which is, as the crow flies, about 12 miles S.S.E. of Bhavánipatnam. From Bhavánipatnam the road runs to the western border of Kálahundy, and then in a generally N.N.W. direction to a point about two miles east of Arang, where it strikes the Raipur and Sumbulpur road.

3. With ordinary surface repairs the whole road from Bhavánipatnam to Raipur is easy for wheeled traffic during the open season, and it lies through fertile and for the most part well-cultivated country, as will be seen from the accompanying extract from notes recorded by me when marching along this route with carts in February and March last. I have estimated its present length at 179 miles, but probably by straightening the line in places the distance may be reduced to about 165 miles, and of this distance only some 35 miles are in feudatory territory.

4. Looking at the proposed railway from the Central Provinces point of view, there can, I think, be no question, but that the line most calculated to open out this division is the one I have sketched, and I should judge that the Vizagapatam authorities are in its favor. I have therefore written to Mr. Nordmann at Bhavánipatnam recommending it to his attention.



*Statement of Stages from Bhavánipatnam to Raipur.*

No.	Stage.	REMARKS.
1	Bondesor or Bhavánipatnam to Nandol.	Came out here <i>en route</i> through Kariar to Raipur, distance about 12 miles; road fair for the wheeled traffic of the country; soil sandy running into brown and black; rice, tilli, peas, pulses, wheat and chenna grown; country fairly cleared, and the following villages passed through:—Singjerram, Pukjori, Barjola, Tiljori, Kharra, Tekri, and Atangura. Met many small country carts taking rice to to-day's bazaar at Bhavánipatnam. Nandol has a fair encamping ground on the bank of the Sogora river, which has clear water.
2	Nandol to Daspur .	Distance about 10 miles; road good; in many places raised and generally aligned and planted with roadside trees; country generally well cleared and cultivated with rice, pulses, some chenna and sugarcane; high and picturesque hills clothed with forest and bamboos until the Tel river is reached, where the hills open out; soil sandy running into black and brown; passed through or near Kendupati, Omatola, Makartola, Bondagaon, Poondah, Faranggaon, Omta, and Daspur; good shade at Daspur, but the grove is close to sugarcane fields and a bunded nullah; passed several nice groves on road.
3	Daspur to Golamunda.	Distance about 9 miles; came through Dumberbahal, Valuehua Kholiakani to Golamunda; soil black the first half and sandy the second half; a fair amount of cultivation, chiefly rice and castor; a few teak trees appear near Golamunda; a mango tope here with fair shade, but not a nice encamping ground. There is a Kálahundy Police post here.
4	Golamunda to Nandgaon.	Distance about 9 miles; past the Kariar frontier near Dhungiamunda for three-fourths of the way black soil and afterwards sandy; country fairly cleared, road rough on the Kariar side; came through Tumra, Dhungiamunda and Cholna to Nandgaon, which is a good encamping ground, having pleasant shade and clear water from the river near.
5	Nandgaon to Lorka	Distance about 9 miles; road easy, although not always properly marked out; country well cleared and fairly cultivated; soil sandy and black; villages poor looking and very dirty; teak about; passed through Borgaon, Gondabahali, Gomargura, Kampur and Ankapur to Lorka; rice, chenna, tilli and castor chiefly grown; good shade at Lorka, but too close to village, and tank water fair.
6	Nandgaon to Polsodar.	Distance about 9 miles; soil chiefly black; small jungle and high grass with few clearings; passed through Khirmal and Lanji to Polsodar; fair shade and fair water, but a good deal shut in.
7	Polsodar to Kolinga.	Distance about 6 miles; soil sandy and black; not much cleared country; small jungle; road fair, but narrow; passed through Domjer. Kolinga has a large clearing and a good place for encamping with abundant shade; water from the river near.
8	Kolinga to Rojona	Distance about 6 miles; road good; soil sandy; crossed the Under river twice; passed some clearings belonging to Chichali and Dharagaon, otherwise the whole distance was through forest chiefly of large trees of all descriptions except teak and sal-rojona; has a fair extent of cleared land, with fair shade, and clear water from the Under river.
9	Rojona to Kisima .	Distance about 9 miles; soil black and sandy; country fairly cleared, but not much cultivation; small open jungle; passed through or near Belgaon, Agarom, Bila, Bandanpali to Kisima; villages all small, but many have good mango groves; good shade at Kisima, but encamping place too low.
10	Kisima to Torbor .	Distance about 9 miles; road good; small jungle the whole way; soil at first black, afterwards sandy, open clearing at Torber, and clear water but no shade.
11	Torbor to Tarnot .	Distance about 12 miles; road good for the first half and then rocky and stony and over broken ground by the hills; soil of the first half chiefly black; only one village Limdi passed through; country has once been fairly cleared, but now has retrograded.

*Statement of Stages from Bhavānipatnam to Raipur—continued.*

No.	Stage.	REMARKS.
12	Tarnot to Sarabong	Distance about 7 miles; soil chiefly sandy; road good; country cleared, but not much cultivation. There are several tanks here and some sugarcane cultivation; villages passed through this morning were Jilmila, Rothipali and Malibata.
13	Sarabong to Tendubarra.	Distance about 6½ miles; road fair; no running water in the Jong river; passed through Pathalghutkuri; the whole distance from this village to Tendubarra under forest, but not unpleasantly dense; soil sandy chiefly; no teak and only sál here and there. Tendubarra has a fairly good clearing and fair water, no shade. Tendubarra is an high tableland, probably 1,400 or 1,500 feet above the sea. There is a good clear water from a kutcha well here.
14	Tendubarra to Bodrabanda.	Distance about 11 miles; road good; soil hard, red loam, no stones and only slightly rocky in one or two places; descents and ascents easy, nullahs not troublesome; in fact as good a country road as one would wish, and this is the road the Kariar Amlah induced Mr. Fisher not to travel over in 1873 and which they tried to induce me not to take. It should be widened and improved and will make a capital cart-road at all seasons; passed Sirgidi, a small hamlet of Kariar, and a little way beyond entered the Khalsa of Raipur and passed through Charbatí and Koknajer to this. There is some shade here and clear water from a kutcha well; all country over forest, but neither teak, sál nor bamboos to be seen.
15	Bodrabanda to Karti	Distance about 11 miles; soil sandy; country well cleared; road fair, but heavy in some places from sand; rice and some sugarcane grown. Karti has a good encamping ground and has a Police station-house.
16	Karti to Mahasamund.	Distance about 9 miles; soil at first black, afterwards sandy and then gravelly; country fairly cleared with mowah trees about; road fair and apparently much travelled by carts. Mahasamund is a large village on a gravelly rise, with fair shade at a pleasant distance from the village; rice, sugarcane, ulsi, and chenna grown.
17	Mahasamund to Paragaon (2 miles east of Arang).	Distance about 8½ miles; country cleared throughout; soil brown and yellow and laterite; crossed the Mahānadi by the Gorari ghāt. The river here is much narrower than by the Arang crossing. Executive Engineer is making a branch road to this crossing from the Raipur and Sumbulpur road.
18	Paragaon to Nuagaon.	At Paragaon the Raipur and Sumbulpur road is struck, and the whole distance from Paragaon to Raipur is by that road. About 2 miles from Paragaon, Arang, which has a considerable trade with Kálabundy, is reached, and from Arang to Nuagaon the distance is about 12 miles: country cultivated throughout.
19	Nuagaon to Raipur.	Distance about 12 miles; country cultivated throughout.

NOTE.—The total distance from Bhavānipatnam to Raipur by this route is about 179 miles, but I should judge that by straightening the line in places the total distance may be reduced to about 165 miles.

C. B. LUCIE SMITH,  
Commissioner, Chattisgarh Division.

## V.

No. 19-O, dated Ombadōla, 26th November 1881.

FROM—K. F. NORDMANN, Esq., Executive Engineer on Special Duty,  
TO—The Secretary to Government, Public Works Department.

In continuation of my letter No. 14 R., dated Ryaguddah, 16th instant, giving an account of the *reconnaissance* from Párvatipuram to Ryaguddah, I have the honor herewith to forward an extract from my diary from the 17th



instant up to date; from which it will be seen that there has been no difficulty so far which could in the least obstruct a road or railway. A cart came with the camp to Bisemkattak, and might have come further.

2. The route travelled over has been, practically, almost a level; at least, the gradual ascent from the coast is a very easy one.

There has been nothing like a ghât or sudden and steep ascent in the way, so far; all has been plain sailing, and the people here say there is no ghât either, between this and Asurgor; this I will see to-morrow, and report on from Bôgor.

3. *Cooly labor and material* for work (such as building stone, clay for bricks, timber, &c.) are nearly everywhere available.

4. *The country* is, on the whole, well populated and cultivated, and might even be called rich; certainly, when its natural resources come to be developed, it may look forward to a very prosperous future.

5. *The people and their chiefs* are friendly disposed, and there has been no difficulty, so far, regarding guides, camp supplies, coolies, &c.

6. Along the entire route a great deal of *grain and other produce* is grown, much of which is now sent by pack bullocks to Parvatipuram, where it is bought up by merchants and distributed over the country; all this will go to swell the *traffic* of the railway. Besides this local traffic, there is a regular through-traffic from Raipur, Sumbulpur and intermediate places, to Parvatipuram.

7. I met Mr. Cormac, according to previous arrangements, at *Lonjigar* on the 24th. He had come over ground as high as 1,603 feet, half way between

\* Except at *Lonjigar* which is 1,396 feet. Singapore and *Lonjigar*, while I have not yet encountered a greater altitude than 1,346 feet.\* Mr.

Cormac marched back on the 25th to Chôthopoor (5 miles north of Singapore); thence he proceeds over the Mûsa ghât (near Kûndrû) to Bondesôr, Dâdpûr and Bôgor. I leave this for the last-named place to-morrow *viâ* Asurgor.

8. *Readings of aneroid and thermometers* are taken at every mile, or so, along the route, or at every change of gradient, or remarkable feature of the ground, and at every stream. The "battery" of three aneroids, in a case, is registered regularly at 11 A. M. and 4 P. M. in each camp, so that the heights of all halting-places can be readily ascertained and the others interpolated. It is not feasible to read the "battery" at 10-30 A. M., as we never reach the camp before eleven, having started with daylight. All the original records of every reading, whether made on the coast or on the march, will be carefully preserved, for future reference if necessary.

9. *The longitudinal section of the country* traversed cannot be conveniently prepared on the march, partly because all spare time, when the daily march is over, is occupied with packing, unpacking and general camp duties, and partly because the aneroid readings at the coast are not at hand when wanted, but come in a week or so after date, and will arrive still more irregularly later on. For the same reason, the altitudes now reported, and arrived at by simple methods without tables are, although very nearly accurate, strictly only approximate; the final altitudes will be given in the *section* which I shall prepare at Raipur, where I intend to make a halt of ten or twelve days to bring up arrears of reports, accounts, &c., and refit the expedition for the journey southwards.

10. This part of the reconnoissance I propose to carry out in two divisions; one party proceeding from Raipur, *viâ* Dhamtari and Kankér, to Raigarh; while the other marches *viâ* Râjim to Noagarh and up the valley of the Sondor river, to Raigarh.

11. *The monsoon* has, on the whole, been merciful to the party; only one tent has been blown down; the people say the rains are over, the cold weather has commenced, and that there will be no more rain, although last night heavy clouds came up again from the north-east, but they have passed on.

12. *The health in camp* is satisfactory; the Hospital Assistant has recovered from his attack of fever; there are only a few slight cases of cold and fever.

13. I send, by parcel post, three specimens of *quartz* (which I have had pulverized for convenience in transit), two from Gowdugooda and one from

Kordáband. Both places are between this and Bisemkattak. I should be glad if the specimens could be chemically analyzed and assayed, to see if they contain any valuable metal.

14. So far the special *tappal* despatched by the Sub-Magistrate from Ryaguddah, has arrived in camp pretty regularly twice a week. How it will be beyond Bôgor, remains to be seen.

I request that all orders, &c., despatched after receipt of this, may be addressed to "*Arang, Central Provinces, to await arrival*," where I hope to be about the 20th proximo.

P. S.—I must apologize for the indifferent calligraphy and the numerous corrections, &c., in this letter and accompanying extract from notes; the only writer I have been able to engage for the tour is but an indifferent office hand.

## VI.

*Extract from Notes of Reconnaissance between Bisemkattak, Ombadôla and Lonjigar, 17th to 25th November 1881.*

*From Ryaguddah to Bisemkattak.*—Distance 29 miles 4 furlongs 191 yards.

It had been arranged that while I marched *viâ* Bisemkattak and Ombadôla to Bôgor on the Têl Nadi (which is a tributary of the Mahânadi), Mr. Cormac was to proceed *viâ* Singapore, Bondesôr and Dâdpôr, likewise to Bôgor, where our camps were to be rejoined. Meanwhile we were to meet, *en route*, at Lonjigar; I coming from Ombadôla, and Mr. Cormac from Singapore, so as to complete the section of the line from Singapore to Ombadôla. Accordingly I left Ryaguddah on the 17th November for Bisemkattak, while Mr. Cormac started on the 18th for Singapore. His own report on his march, with sections, &c., will follow.

*17th November, Ryaguddah to Gingerabâdi.*—Distance 8 miles 2 furlongs.—Rise 49 feet.—Marched through a fine, level, upland country; light soil, well cultivated with extensive dry crops and some paddy. No jungle in this part of the valley, which is formed by two parallel ranges of hills, about 3 miles apart. Saw scarcely an acre of uncultivated land for several miles. The country is easy to travel over; there is a bandy track to which the Local Fund Board are doing some repairs.\* Met some rice coming from Patna and Kâlahundy, going to Parvatipuram. There are good toposes for camping along the whole route; good water is almost everywhere to be found in the small hill streams.

In the third mile there is some broken and irregular ground at the large village of *Comellypettah*,  $5\frac{1}{2}$  miles from Ryaguddah; the *Nagavully* river has to be crossed below its junction with a smaller affluent. The river in flood is 363 feet wide with a maximum depth of 15 feet. The bed is sandy, the low banks are flooded in the heavy rains, there is no rock for foundations visible.

To the north of this river the level upland valley continues as before; there is some jungle, but still much dry cultivation, with numerous fine mango, tamarind, fig, ippa and other trees growing in the fields. *Tree planting* is largely attended to by the people, and the trees are fenced in and cared for.

*Topes* occur frequently. The names of villages I passed are Kulliagoodah, Kotapettu, Prodiguda, Comellypettah, Jugganaidupetta.

Near *Gingerabâdi* a number of rocky hillocks are dotted over the valley. The rock is gneiss. There is a swampy pond, fed by hill drainage and covered with lotus flowers, near the village; the road passes below the pond. The water here is not very good. The fine upland valley now becomes narrower, the ground more uneven, the extent of jungle greater.

The soil here is rich, of a dark brown color, almost black. There is a good deal of *paddy* cultivation.—It rained in the afternoon and at night.—Thermometer 80 to 85° F.; height of *Gingerabâdi* above sea level 736 feet.

*18th November, Gingerabâdi to Ballingy.*—Distance 10 miles 4 furlongs 123 yards.

Rise 40 feet. Thermometer 74 to 86° F.; height of Ballingy above sea level 1,136 feet.—Started as usual at 6 A.M.

The sky was covered with clouds, the atmosphere moist, the low hills were wrapped in mist.

Jungle and cultivation, both wet and dry, alternate along the track.

The soil varies, being sometimes sandy, then clayey, loamy, some black. The track is smooth and level, and the country studded with small hillocks, 100 to 200 feet high, some rocky, some with patches of cultivation, the latter chiefly castor-oil and cholam.

In the third mile the track leads for some distance along a gently sloping hill side. There is more jungle and less cultivation. Some rock is met with; gneiss mixed with quartz and conglomerate and containing occasionally red garnets (*yerra kâllu*).

Trees abound in the cultivated fields, such as ippa, fig, tamarind, blackwood, matti, mango, and jack; fine old banyan trees, with far spreading leafy roofs supported on root



pillars dropped from the branches; and others. The soil is mostly light, but seems to grow anything.

In the fourth mile there is some uneven and broken ground on both banks of a stream\* which when in flood is 350 feet wide, with a maximum in depth of 15 feet.

\* 3 miles 3 furlongs 110 yards.

The bed is sandy, there is no rock visible near the crossing; one bank is high, the other low (alternately) and flooded.

The river lies in a deep bed. The traffic I met consisted largely of Bengal gram (chenna) from Kalahundy, going to Párvatipur. On the northern bank the ground rises rapidly from the river bed, and is covered with light jungle.

In the fifth mile near the village of *Gújelpádu*, there is some undulating ground, but offering no obstacle. Small *kunker* limestone is here scattered over the surface, and there is a tank near the village. At the sixth mile is the village of *Sunta Baddigáum*, at the foot of a low ridge covered with jungle. The valley here is only a mile and a half wide; the western ridge rocky. The track continues smooth and level over light soil, as before. Wet and dry cultivation, paddy, sugarcane, ragi, gram, linseed (*sersá*), gingelly, rape, mustard, cholum, cumbu, castor-oil, and tobacco, &c., date and sago palms.

In the seventh mile is a stream, 130 feet wide and 10 feet deep in flood, with ill-defined banks, bed sandy with gravel, no rock visible.

Country hilly, track undulating, partly along hill side, more jungle than cultivation. The sandy path descends slightly to *Báthpúram*, eighth mile.

In the ninth mile another stream, 112 feet wide and 8 feet deep in flood. Banks alternately high and low, one bank flooded. Bed, hard soil with small stones and gravel; no rock near. For some distance through hilly jungle over broken ground; no cultivation; *kunker*, limestone on the surface. Then flat country again, with patches of dry crops and numerous trees; some good timber, viz., teak, matti, and blackwood.

The sides of the hill ridges forming this valley are now wooded, and partly cleared for cultivation.—Clouds threatening ahead; rain at night.—One of the Vizianagram elephants was sick and sore, and refused to work; some of the tents had to be carried by pack bullocks and coolies.

There is a thatched bungalow at Ballangy belonging to the Bisemkattak Rajah, who had sent a Kotwal to meet me here to act as guide and procure supplies, coolies, &c. The village is a very small one, but the surrounding country is well populated, little hamlets lie hidden in nooks and corners.

19th November, Ballangy to Bisemkattak.—Distance 10 miles 2 furlongs.

Rise 18 feet. Thermometer 74 to 84° F.; height of Bisemkattak above sea level 1,114 feet.

Distance of Bisemkattak from Vizagapatam, 146 miles 4 furlongs.

Low clouds and mist. The ground along the track rises steadily; there is much jungle and little cultivation; the valley becomes narrower. The path runs along the foot of the eastern ridge, where very slight hill side cutting would be required for a road or railway. This ridge is covered with dense jungle and forest; the soil is good and the vegetation luxuriant, which shows there must be ample moisture; coffee ought to thrive here. The ridge on the left is more rocky, the alluvium on its eastern aspect partly worn away by the north-east monsoons of ages. The hill sides are cleared in patches, whereon grow the castor-oil plant and cholum.

A mango tope in the third mile; country again flat, the two parallel ridges only about a mile apart; they rise here up to 500 feet. Very few patches of cultivation along the route.

At 3 miles and 3 furlongs a stream, width and depth in flood, respectively, 85 feet and 8 feet. Banks well defined, bed stony, but no solid rock apparent.

The track now runs across the slope of the western ridge; very slight hill side cutting wanted for the road. At the fourth mile a small but deep nullah: bridge, of 10 feet span, 15 feet high, required.

The ground is uneven, cut up by gullies. Some of the peaks of the *Níámgi* hills come in sight. Soil brown clay mixed with sand; jungle. Another stream, smaller than the last, near the village of *Baliapodor*. The track here changes again to the slope of the eastern ridge, on which there is some rock cropping out along the track. The ground is irregular, but not difficult, for a road. At 4 miles and 6 furlongs there is a bifurcation of tracks, one line leading to Bisemkattak, the other to *Báriguda* and *Tikirapara*.

Near *Satikóna* is the summit level of the track, so far, 1,346 feet above sea level; from here the ground descends to Bisemkattak. I met some carts with

Aneroid read 2872.

rice, from *Tikirapara*, going to *Párvatipuram*. The cart-men complained that the Sakal (Dhoby) of *Bariguda* charged them one anna for each cart as a toll; hence they came by this track instead of the easier one by *Bariguda*.

Altogether I have not met very much traffic along this line up to this, perhaps 150 bullocks a day. The Brinjarries seem to prefer the route by Singapore to and from Raipur, on account of the open and level ground to be found along that route.

There is much cultivation round the village of *Satikóna*. From here begins a steady descent along the slope of the eastern hill range. At 6½ miles the track passes through a saddle, thence the descent continues towards *Matakeri* and *Batugada*.

There is light jungle and but little cultivation. Soil ordinary reddish clay with sand. The path bends to the eastward to get round the Bisemkattak hill.

*Bisemkattak* is a little way out of the straight line to Tikirapara, but being a place of some importance it would seem correct to take the rail to Bisemkattak and have a station there.

The path continues through jungle, with occasional clearings and sparse cultivation, over level ground along the foot of the hill, to *Bisemkattak*, which is situated in the midst of hills and jungle, with a considerable extent of dry crops and paddy fields. To the west rise nearly up to 5,000 feet the peaks of the beautiful *Nidmgiri hills* (the nearest only 5 miles from here); a range some 20 miles long by 5 miles in width, covered with jungle and forest.

If the rail is taken here, these hills may in time become a local *sanitarium* as well as a resort of planters. *Coffee, tea, and cinchona* should thrive on the slopes.

There was *heavy rain* on the night of the 19th; one of my tents was blown down and damaged. It rained on the 20th during the day, and again very hard at night. The monsoon seemed full upon us. I despatched a camp to Kodáband *en route* to Ombadóla.

20th November, halted at *Bisemkattak*.—The Tāt Rajah (who pays tribute to the Rajah of Jeypur) was so civil as to call upon me. He speaks Oriya and some Hindustani. He expressed himself highly pleased with the prospect of a railway, and offered all assistance in his power to the reconnoitring party. He has been reigning for the last seven years. His people promptly furnished guides, coolies, camp supplies, &c., and he was also good enough to lend me one of his elephants to accompany the party as far as the Tēl Nadi, to relieve the Viziana-gram elephants, one of which has a sore on the shoulder, seems much fatigued, and is unable to carry its proper load.

I returned the Rajah's visit within an hour, and he asked me to inform the Government that he had done all he could in furthering the expedition, which I have much pleasure in herewith bringing to notice.

The Rajah sent a Kotwal with me to assist my camp on the road. The Police Inspector, an Oriya man, also offered to accompany me, which offer I accepted; his beat extends as far as Ombadóla, and he made himself very useful in camp and on the march.

The Hospital Assistant still suffered from fever at *Bisemkattak*, but has since been free from it. He brought a cart to this place all the way from Parvatipuram, but sent it back from *Bisemkattak*, as it has become difficult (though not impossible) to take the cart further. Being sick, he has now moved onwards in an improvised dooly.

The general health in camp is satisfactory.

From *Bisemkattak* to Ombadóla. Distance 23 miles 7 furlongs.

Distance of Ombadóla from Vizagapatam 117 miles 3 furlongs.

21st November, *Bisemkattak* to *Kordáband*, 12 miles. Rise 38 feet. Thermometer 69 to 77° F; height of *Kordáband* above M. S. L. 1,192 feet.

A fine morning, the clouds rising, the sky gradually cleared up, a cool northerly breeze set in, and it seemed as if the monsoon had passed on southwards for good. There was also a change in the temperature; it suddenly became cooler.

In the first mile a *stream* was crossed, 100 feet wide when in flood and 6 feet deep; bed, sandy shingle; no rock; gently sloping banks.

After passing through half a mile of *paddy fields*, the track lies through dense jungle, between two low ranges of hills. The soil is light clay, mixed with sand, and sometimes stony, very little rock.

The villages passed were *Puttamunda, Goutakal, Gordigaon*; a small *stream* (at 3½ miles) near the latter, requiring a bridge of 10 feet span, 5 feet high. Some dry cultivation near the villages; otherwise dense jungle.

Two furlongs further a larger *stream* near *Goilkóna*, 25 feet wide by 5 feet deep; rock for foundation. Some paddy-fields here. Near the fourth mile the village of *Bondiguda* with *extensive paddy-fields*. Further on *Burchiguda*; dry cultivation in the midst of jungle.

Junction with track from Satikóna to Tikirapara. At 5½ miles the village of *Depaguda*, with *hundreds of acres of rice cultivation*, all by means of little channels taken off from the hill streams. Then some open ground, not cultivated. *Stream* 25 feet wide and 6 feet deep; high banks; no rock; bed, sand with shingle. Some paddy and *sugarcane*.

Village of *Dendra*.—Track goes on through jungle; low hill range on the left, with a few patches of clearing. Very little traffic along this route, which may be owing to the monsoon. Some carts were loading rice in the fields; the crop is just being cut.

At 7¼ miles, *Tikirapara*.—A large double village, *viz.*, for Paiks and Khonds, 100 houses. Tank, wet and dry cultivation. A hundred bullocks, with Bengal gram, from Kalahundy to Parvatipuram.

Numerous trees have died in this part of the country, which may be owing to the effect of the droughts of late years; some men said the trees had been ringed preparatory to being felled for timber and so killed, but I saw the rings only in very few instances.

At 9½ miles a *stream* requiring three spans of 30 feet each, height 10 feet; bed, shingle, no rock. Banks low and flooded; jungle; village of *Jomaraguda*; some dry cultivation.

*Chellanalla* village, 10th mile. Fine tope for camping.

11th mile.—Small *nullah*, waterway required 10 feet wide, 5 feet high; jungle here and there cleared.

12th mile.—*Kordáband*, dry and wet cultivation; fine tope, good water. The Sub-Magistrate of Gúnpúr had sent a peon here to attend my camp.

Height of *Kordáband* above M.S.L. 1,192 feet.



Good camping ground. Tank; thatched bungalow; rich dark soil. *A quartz reef*; sample powdered and sent with the report. No mercury in camp for experiments.—Cold at night. Thermometer 55 to 60° F.

22nd November, Kordáband to Ombadóla.—The monsoon seems to have passed southwards, for good. The night at Kordáband was cold, the sky clear, the morning crisp; not a cloud. Passed through extensive rice-fields to a small *stream* in the first mile; good banks, firm bed, no rock; bridge required, 10 feet span, 5 feet high. Two furlongs further another similar *stream*.

1 mile 3 furlongs.—Village of *Kutubadi*; thermometer at 7 A.M. 57° F.; jungle and dry cultivation; hills on both sides; good tree jungle; soil moderately rich.

One furlong further, small *stream* like the two last; *quartz* in the ridge on the left.

Village of *Doikal*.—Sugarcane, rice and dry cultivation.

3 miles 2 furlongs. *Panimunda stream*.—Three 30-feet spans required, greatest depth in flood 9 feet; rock for foundation. There is a crude *anicut* made here by the villagers who have utilized for this purpose a rocky ledge extending across the bed of the stream; from the anicut a considerable irrigation channel is led off.

\* Specimen sent with report.

3 miles 7 furlongs. *A quartz reef* near the village of *Gauduguda* \*

Two furlongs further a *stream*, with stony bed and high banks; bridge required, 23 feet wide, 6 feet high; undulating country hills on both sides, tree jungle, patches of dry cultivation.

5 miles 3 furlongs.—Another *quartz-reef* near *Sivapodro*. The track then passes over a small ghât about 50 feet high (the railway would round the hill or be cut through it) to the village of *Dombisi*.

A small *stream*, 14 feet wide, 4 feet deep in flood. The jungle here is a *forest of large trees*, containing some good *timber*, especially *matti* (Telugu, *madhi chettu*).

A small *nullah*, coming from swamps and paddy-fields on the rising ground to the left, 8 feet wide, 3 feet deep in flood.

6 miles 6 furlongs 187 yards.—Two villages close together of the name *Mudirikuppa*, one for Khonds, the other for Paiks or Gaudus; hilly undulating ground; jungle, with some cultivation.

7 miles 2 furlongs.—*Streams*, 60 feet wide, 8 feet deep in flood; good banks, no rock.

The track, after leaving *Bod Mudirikuppa*, passes through a *gorge* with dense jungle; some hill side cutting required, then flat ground again. In the gorge I picked up some rich *magnetic iron ore*, and some *ore of antimony*.

8 miles 5 furlongs.—Village of *Chumakonti* (Kh6nd). The railway here should follow the course of the *Bongsdara* river.

9 miles 3 furlongs.—Village of *Peddagoodah* on the left, *Ráinigooda* in front.

10 miles 67 yards.—Cross the *Bongsdara* river above its junction with Ombadóla river; rock for foundation, gneiss studded with quartz; kunker, limestone on the spot; width of stream 210 feet, greatest depth in flood 15 feet; banks flooded.

11 miles 7 furlongs.—*Ombadóla*.—Extensive rice-fields, fine country, well populated, studded with topes and trees and surrounded by hills, so that it is difficult to obtain a view; height of Ombadóla above M. S. L. 1,196 feet.

23rd November, halted at Ombadóla.—Heavy dew at night, mist in the morning. Thermometer at 6 A. M. 53° F.; in the day up to 80°.

The old Amin of Ombadóla, who is under the Rajah of Bisemkattak, came to see me and expressed himself pleased with the prospect of a railway. I despatched a camp to *Lonjigar* with one elephant, five bullocks and ten coolies. The Police Inspector from Bisemkattak with some of his men, two of my Policemen, and the Ombadóla Amin's son accompanied the party.

I had to sleep in the Dresser's Rowty, as my tent that was blown down and damaged at Bisemkattak was being mended. There is a blacksmith at Ombadóla who, in the most primitive manner, forged thin iron bands out of a thick bar of country pig iron; but there was no carpenter in the place to help in mending the broken poles.

24th November, Ombadóla to Lonjigar.—Distance 12 miles. Heavy dew at night and in the early morning; clear sky in the day; thermometer 6 A.M. 55° F. Through paddy-fields and jungle; track frequently invisible.

1 mile 1 furlong.—*Stream* 126 feet wide, 9 feet deep in flood. Bed sandy and gravelly, no rock, banks low and flooded. Enter jungle, some sheet rock, gneiss with quartz veins, village of *Kutrikupa*, a few huts, with some dry and garden cultivation.

I have noticed so far a singular absence of *game* in these parts. I have not seen, between Párvatipuram and this, a single snipe, partridge, jungle fowl, hare, pig or deer; but jackals are numerous, and bear, pig, sambur, cheetahs and tigers are said to be in the denser jungle on the hills.

2 miles 158 yards.—Village of *Kutrapali*; high and dry ground, little cultivation, some cotton, oil-seeds, beans, and ragi; then jungle again. Passed the boundary between the *Jeypur* and *Kalahundy* estates.

Village of *Dhorabetta*.—A few small patches of paddy in the jungle, irrigated by little rills led from springs or small hill streams. Joined the track leading from *Lonjigar* to *Raipur* via *Kutegu*, *Topi*, *Kindera*, *Prokribund*, and *Sigriguppa*; another small *nullah*.

4 miles 1 furlong.—*Village of Bijelhadu*; some dry crops and paddy in the midst of jungle.

4 miles 7 furlongs.—Village of *Toral*; a little beyond, abundance of gneiss rock which can be quarried for building stone.

7 miles 1 furlong.—Good camping ground in a *tope*; again jungle.

7 miles 2 furlongs.—*Stream* near the village of *Nangelbeda*, 34 feet wide, 9 feet deep in flood; good banks, gravelly bed, no rock near crossing. Half a mile further a small *nullah* with rocky bed. *Kunker limestone* is found on the surface in many places along this day's route,—jungle again; then a shallow *stream*, 26 feet by 4 feet; sandy bed, low banks, no rock; then an irrigation channel led off the stream through some deep cutting.

Village of *Batuguda*.—The hard clay in the bed of the channel has been worn by the water into the outward appearance of laterite, but there is no laterite here.

Village of *Chatterpore*.—Clear water in the small hill streams.—This part of the country is but sparsely inhabited, and there is ample room in these jungles for *immigrants*. The *soil* is good enough for paddy, sugarcane and all ordinary dry crops; water from streams and springs is plentiful; trees, shrubs and grass grow luxuriantly; the paddy and ragi crops look very fine, although the rainfall has not been ample this year.

9 miles 6 furlongs.—Another village of *Batuguda*; some dry cultivation, then again jungle. Here begins a *dense jungle and forest of young trees*, the latter 15 to 20 years old; soil varying, sometimes light and sandy, sometimes heavy clay. Small *nullah*, 6 feet wide by two feet deep.

11 miles 1 furlong.—*Nullah* 15 feet wide and 4 feet deep in flood, high banks, stony bed, no rock visible, which, however, is not far below the surface here. The sand in this stream contains shining yellow mica dust.

12 miles.—*Lonjigar*, at the foot of a hill upwards of 3,000 feet high, part of the *Niámgi*, range; large village, surrounded by hills; 100 houses (mud huts, thatched), ample fields, gardens and trees; a tank under construction; *soil* dark, rich clay, some nearly black. There are weavers, blacksmiths and goldsmiths in the village; no carpenter, just as at *Ombadola*. The old headman of the village was very civil, brought offerings of rice, fruit, &c., and said he was glad that there was a chance of a good road or railway being made in these parts. He also said that there had been no white man at *Lonjigar* since the Surveyors were here, some eighteen years ago.

The Rajah, who is tributary to *Bondesor*, has gone to *Raipur*; his two sons called upon me, one 25 and the other 18 years of age. The younger one can read and write *Ooriya*, the elder has no education. They speak *Ooriya* and a little *Hindustani*; the elder is a *Shikari* and told me he had shot five *tigers*. There are *man-eaters* here, and people are occasionally carried off.—Here I met Mr. Cormac who had come up from *Singapore* according to arrangements made at *Ryaguddah*.

The report on his march from *Ryaguddah* will, I hope, be sent from *Bôgor*.

The greatest height he has come over between *Singapore* and this is 1,603 feet; thermometer 52° F. at night.

The people at *Lonjigar*, as well as at *Ombadola* and along the track between the two places, were quite civil, giving correct information and showing the way readily when asked. Nor were they shy; neither men, women, nor children ran away at our approach, as they sometimes do on the *Jeypur Hills*. The men have a martial look about them.—Height of *Lonjigar* above M.S.L. 1,396 feet.

25th November; return to *Ombadola*, while Mr. Cormac marched back to *Chothopoor* (on the way to *Singapore*); whence he is to go on to *Bondesor*, *Dádpur*, and *Bôgor*.

The people say the *monsoon* is over, there will be no more rain, and that the cold weather has set in. However, on the evening of the 25th, heavy clouds were coming up again from the north-east, and it was a warm evening in consequence; but the clouds have gone off southward.

OMBADOLA,  
26th November 1881.

K. F. NORDMANN,  
Executive Engineer on Special Duty.

## VII.

No. 20 B., dated *Bôgor*, 4th December 1881.

From—K. F. NORDMANN, Esq., Executive Engineer on Special Duty,

To—The Secretary to Government Madras, Public Works Department.

I HAVE the honor herewith to forward the report and "notes" on the progress of the *reconnaissance* from *Ombadola* to *Bôgor*, and from *Ryaguddah* *via* *Singapore*, *Bondesor* and *Dádpur*, in continuation of my letter No. 19-O, dated 26th ultimo (from *Ombadola*) and its enclosures. The country traversed is described in detail in the notes.

2. The route from *Ombadola* northwards has continued to prove an easy one. The only approach to anything like a *ghát* is a decline which begins on the *summit level*,\* 3 miles and 5 furlongs north of *Ombadola*. Thence the present track descends by varying, but chiefly easy gradients to the 7th

\* 87 feet above *Ombadola* and 1233 feet above M.S.L.



mile, with a total fall of 220 feet in 3 miles and 3 furlongs, or about 1 in 80. The descent, along the track, at first is rather steep immediately below the summit; but there is no need for such a rapid descent, as there is room to take the line on higher ground along the hill side and so reduce the gradient which need not exceed 1 in 100, if the northern foot of the descent is thrown out as far as the 8th mile from Ombadóla, which is quite practicable. *This is all there is like a ghât on this line.*

3. Mr. Cormac coming from Bondesor joined me here (Bôgor) on the 1st instant. I submit, in original, his report on his march, and an approximate longitudinal section of the country travelled over by him. The altitudes given in his section, though nearly correct are strictly only approximate, as he has only two detached aneroids which read differently from mine (and a thermometer), and had not the "battery" to refer to which came with my camp. Moreover the aneroid readings on the sea coast are wanting to complete the exact calculations. A revised section will have to be prepared when those readings are all received. For this reason I defer, as I have already reported in my last letter, sending the section of my route till I have all the sea coast readings. I hope to send the correct sections from Raipur; meanwhile the approximate altitudes, which are very nearly accurate, are indicated in the notes.

4. It will be seen from Mr. Cormac's report and section that the Singapore-Bondesor route, which passes over the Músa ghât a mile north of Kúndrú, ascends to an altitude of 2,048 feet, and had a considerable ghât to descend on the northern slope; while the highest point reached on the Ombadóla route does not exceed 1,346 feet, near Satikóna, with (practically) no ghât, or only a faint approach to one. Hence, other considerations on both lines being equal, the Bisemkattak-Ombadóla line must be considered preferable, for a railway, to that *viâ* Singapore and Bondesor. Nor is it advisable to take the line from Ryaguddah, *viâ* Singapore and Lonjigar, to Ombadóla, since there is a ghât to cross, 1,603 feet high, between Singapore and Lonjigar (at Tirmui).

5. At Dádpúr Mr. Cormac crossed the trade and old military routes which lead from Chicacole to Kamptee, one *viâ* Bateli, Mukuli, Dádpúr, Junágar, Kankér, Wáirágar and Umber (No. 44 in the Quartermaster-General's route book); and the other *viâ* Junágar, Karial, Arang, &c. (No. 45 in the same book).

1. From Bondesor *viâ* Dádpúr to Bôgor.

2. From Bondesor *viâ* Turkel and past Ojarar to Badbeng.

3. From the Músa ghât *viâ* Junágar, Dádpúr and Manjhér to Karial; or

4. From Manjhér *viâ* Borgáon and Polso lar to Kúmúna; or

5. From Manjhér *viâ* Borgáon, Binapur and Balda to Torbor.

6. The short cuts marginally indicated, which might be obtained by using the Músa ghât, would scarcely compensate for the inconvenience and extra cost that would be caused by that ghât; the less so since those short cuts would have to cross several formidable rivers, besides passing through some otherwise difficult country.

7. Bôgor is 628 feet above M.S.L., 205½ miles from Vizagapatam, and about 160 miles from Raipur by the route *viâ* Kúmúna, Nara, and Arang. There is a good bridge site for the Tél Nadi near Bôgor, with rock visible in the bed on the northern bank, and extending most probably across the river, not very deep below the sandy bed. This bed is rather treacherous; in trying to cross this morning, my horse sank with me up to the girths into the quicksand. The water is sufficiently low to permit fording. In heavy monsoons the banks are flooded on both sides; hence considerable embankments will be required in order to have the bridge, as it ought to be, at least 30 feet above the deep bed.

8. The last letters and papers I have received are dated the 13th November. I despatch this post to Bisemkattak by the Tát Rajah's elephant which returns from here according to agreement; thence the packet is to be forwarded by the beat constable to Ryaguddah. I scarcely expect to receive any further tappal until I reach Arang. I write to Ryaguddah and Vizagapatam to redirect to Raipur. I request that all letters may, till further notice, be addressed to "Raipur, C.P., to await arrival."

9. Fever begins to prevail in the camp.

10. We leave this to-morrow for Karial, Kúmúna, &c.

## VIII.

*Extract from Notes of Reconnaissance, Ombadôla to Bôgor, 26th November to 3rd December 1881.*

26th November, Ombadôla.—Went out and examined the lay of the country with reference to the proposed railway.

*Traffic.*—Thirty pack bullocks from Maringi and Kurpâni, without loads, going to the Nandapur taluk of Jeypur, *via* Kâlahundy, to bring down grain, &c.

A hundred and ninety pack bullocks coming from Kâlahundy, going to Pârvatipûram, with rice, gingelly and mustard seeds, Bengal gram and paddy.

*Cooly labor.*—This is at present very cheap, there being so little demand for it; except for agricultural operations when the laborers are paid in kind, coolies can be had at  $1\frac{1}{2}$  annas per day. If there were a heavy and steady demand for labor, as on a line of road or railway, the daily rate would doubtless be higher.

*Artizans.*—These are very scarce at Ombadôla. I could get a jungle blacksmith to repair my broken tent poles, but there was no carpenter in the place. Weavers there are, but no tailors or chucklers; anything required in this line by the well-to-do people of Ombadôla has to be procured from Pârvatipûram.

27th November, Ombadôla.—Sunday. Dew at night and in the morning. Thermometer at 6 A. M.  $55^{\circ}$  F. Fine day. Despatched one camp 10 miles ahead to Sorigura *en route* to Bôgor.

*From Ombadôla to Bôgor; 28th November, Ombadôla to Sorigura.*—11 miles 5 furlongs 176 yards. Descent from Ombadôla to Sorigura 269 feet; distance of Sorigura from Vizagapatam 182 miles. Height of Sorigura above M. S. L. 927. Thermometer 6 A. M.  $60^{\circ}$ .

Through paddy-fields and jungle; at 5th furlong a *stream*, 35 feet wide, 7 feet deep in flood, good banks, gravel bed. Planted topes alternating with jungle and dry crops. Village of *Kumrabal*; small *stream* 10 feet  $\times$  4 feet; jungle.

*Bijapûram.*—Jungle and dry cultivation.

*Ishapur.*—Jungle and dry cultivation. The road, if so it may be called, is here a broad and well-beaten bullock track leading through jungle.

At 3 miles 5 furlongs 153 yards from Ombadôla the *summit level* is reached by a steady and gentle ascent without a ghât or anything approaching a ghât. The summit level is 1,283 feet above M. S. L. and 87 feet above Ombadôla; a rise of 1 in 225 from the latter place.

From this summit begins the descent northwards. A small stream requiring a 6 feet culvert; gneiss rock with quartz and felspar; jungle.

4 miles 2 furlongs.—Village of *Bânpûr*. Dry and wet cultivation, undulating ground.

4 miles 5 furlongs 197 yards.—A *stream* 30 feet wide, 10 feet deep in flood, banks high, rock for foundation on one bank, broken ground, stony soil. A furlong further another small *stream* 9 feet  $\times$  3 feet, much rock about here; soil, clay with some kunker; jungle. The easy decline continues.

5 miles 3 furlongs.—Village of *Peramara*.—*Traffic.*—Ninety bullocks from Binka to Pârvatipûram with paddy. The ground is irregular, broken and undulating, but there is no obstacle to road or railway.

Three furlongs farther a small *stream* needing a 6 feet culvert; some paddy-fields. Hill ridges to the right and left of the track, 3 to 4 miles apart, the hills rising upwards of 2,000 feet above this, well-wooded, fit for coffee, tea and cinchona.

7 miles 176 yards.—Village of *Boreguda*. Some dry cultivation in the midst of jungle.

*Traffic.*—Pack bullocks from Pârvatipûram going northwards to bring grain.

*The fall from the summit level to this* is 220 feet in 3 miles 3 furlongs, or about 1 in 80. But this gradient can be eased by keeping on higher ground and throwing the foot of the descent a mile further out, whereby a gradient of 1 in 100 for a distance of  $4\frac{1}{2}$  miles may be obtained. *This represents all there is, on this side, in the shape of a ghât.* It is only the present track that descends somewhat rapidly (as the section will show) from the summit, but there is ample room, by taking the line on higher ground along the hill side, for an easier descent. The ground is, on the whole easy, and there will not be much hill side cutting required.

8 miles 1 furlong, the country now becomes flat again, the village of *Dengen* on the right, *Kârgati* on the left; near the latter a large pond or *tank* with wet fields under it; some dry cultivation surrounded by jungle, ground irregular and undulating, and cut up by gullies; soil, red clay.

9 miles 2 furlongs.—*Boundary* between the Bisemkattak (Jeypur) and Kâlahundy estates, marked by heaps of stones where the line crosses the track. Dense jungle of trees and shrubs; matti wood plentiful; stony soil.

*Sigriguppa*, the first village in Kâlahundy territory; mud and thatch bungalow without

\* *Viâ Santpûr and Dâdpûr.* windows. From here 4 tracks branch off, *viz.*, to Lonjigar, Bondesor,\* Asurgor and Ombadôla. *Forest* of large trees; some good *timber*, especially matti, but little undergrowth.

10 miles 3 furlongs.—*Stream*, waterway 20 feet  $\times$  5 feet, high banks, gravel bed. The hill range on the left rises up to nearly 3,000 feet, and is well wooded; small *nullah* 10 feet  $\times$  5 feet; abundance of kunker limestone about.



11 miles 50 yards.—*Stream* 25 feet  $\times$  6 feet, stony bed, good banks, no rock visible ; all jungle, no cultivation.

11 miles 5 furlongs 176 yards. *Soriguro*.—A few huts in a small clearing in the midst of a dense jungle. A kind of wild ginger grows here, the people use it medicinally to heal sores.

29th November, *Sorigura to Asurgor*.—Distance 10 miles 6 furlongs. Height of Asurgor above M. S. L. 699'; descent from Sorigura to Asurgor 228 feet. Distance of Asurgor from Vizagapatam 192 miles 7 furlongs. Heavy dew in the morning ; thermometer at 6 A. M. 57° F. An armed man, sent from Lonjigar to my camp for assistance and carrying sword and hunting knife, led the way.

The track runs alongside of the *Sandul stream* through a dense forest of good timber trees, old and young ; matti abundant, some yégi, sál and blackwood. An ample stock of timber for railway sleepers, &c. ; soil, virgin.

1 mile 6 furlongs 117 yards. Crossed an affluent of the *Sandul stream*, 160 feet wide and 16 feet deep in flood ; bed shingle and sand, banks high and low alternately, the lower side flooded in the rains. All virgin jungle and forest here, without a patch of clearing or cultivation for more than a mile. Here I heard the first jungle cock in these parts.

Village of *Padmara*, with a large pond or *tank* ; country flat ; soil, light clay with sand. In the third mile the jungle becomes lighter ; some paddy-fields and dry cultivation ; *trees-ippa*, matti, fig, tamarind mango, stunted date, gooseberry and other jungle trees.

Village of *Poremalla*.—Heavy soil ; enter jungle again.

4 miles 1 furlong.—An irrigation *tank* newly constructed or repaired by the people of Bâkel, a village a mile further north.

4 miles 7 furlongs 114 yards. *Bâkel*. A largish village, wet and dry cultivation, paddy and sugarcane, horsegram, ragi, mustard, and gingelly ; low hill ridges, east and west, 2 to 3 miles apart.

*Olisirka*.—The people's swamies or worshipping places here consist of a stump or block of wood let perpendicularly into the ground with its top rudely carved ; scrub jungle, much stunted date, long coarse grass ; dark clayey soil.

6 miles 2 furlongs. *Talagaon*.—Wet and dry cultivation. The villagers here possess more cattle than I have so far seen since Ryaguddah ; the village pig is not wanting, nor the pariah dog. I have seen no donkeys for some time, nor dhobies. There is a good deal of open ground around this village ; then scrub jungle again. The villagers here understand Hindustani, besides Ooriya.

Half a mile further a pond or *tank* ; irrigation is carried on under it as well as round its margin on three sides. Country comparatively open ; good ground for a large camp ; good grass, plenty firewood, water from the *Sandul river* close by, ample straw and grain, other supplies procurable. The large village of *Norola* to the right ; heavy dark soil, no stone or rock.

*Sorigura*.—Wet and dry cultivation, numerous cattle.—There are carts here with solid wooden wheels, 4 feet diameter, made of three segments ; wooden axles.

8th mile.—Nearing the village of *Mandel*, a *tank*, gardens of sugarcane, rice-fields, a few young trees planted, fenced in and taken care of. The village is of a good size and there is much cultivation all round ; soil nearly black ; country open. From here leads a track to Bhavânipatnam (which is the popular name used about here for Bondesor.)

10 miles 6 furlongs. *Asurgor*.—This village has been of some importance in former times, but is now insignificant. There is a large *tank*. The village is situated in a rectangular enclosure of earthen ramparts (an old fort) about one-third of a mile square, with a moat round it that can be filled from the tank. In the moat some paddy is cultivated, and red and white lotus flowers grow extensively. A fine *mango tope* for camping, south-west of the old fort, just under its ramparts and near the moat. Near this tope will be the most suitable site for the future railway station.

*Trees*.—Tamarind, wild fig, ficus religiosa, mango, yégi, ippa, sál, matti, the wild silk cotton tree and other jungle trees ; also several kinds of acacia, among them the tree (I forget the name) of which the bark is used in the south for the manufacture of arrack.—I have met no sandalwood as yet in the jungles.

30th November. *Asurgor to Bôgor*.—Distance 12 miles 4 furlongs. Height of Bôgor above M. S. L. 628. Fall from Asurgor to Bôgor 71 feet. Distance of Bôgor from Vizagapatam 205 miles 3 furlongs ; from Raipûr about 165 miles.

The Police Inspector and the Kotwal from Bisemkattak, who had accompanied the party so far and been very useful, the one in arranging for supplies and coolies and the other in acting as guide, returned from here. A Sowâr mounted and armed and a minor official, sent by the Officiating Dewân of Bondesor to assist the camp, joined this morning.

Thermometer 6 A.M. 58° F.

Crossed the *Sandul river*, 19 feet deep and 170 feet wide in flood. Three 50-foot spans required. Rock for foundations of piers and abutments ; gneiss mixed with quartz and conglomerate ; kunker limestone near the spot.

Enter light jungle, with fields of dry cultivation here and there ; soil, heavy clay, nearly black.

Village of *Borgâon*.—Open country around, extensive wet and dry cultivation, the former under a *tank*. There are no sluices in the bund of the tank ; the water is lifted up by picotas into wooden troughs laid across the bund and so let into the fields below the tank. There I

saw wild geese and duck, some cranes, plover, white gulls, and the first brace of snipe since Parvatipuram. Cattle are numerous about here.—Rice is packed for carriage in bags (about a cubic yard in capacity) made of straw ropes worked together in a manner similar to rattan basket work.

Village of *Sétirpalli*.—Some cotton was being cleaned here by the ordinary hand-machine (*Chúrka*). A tope of young mango trees, about 5 years old, is being attended to; extensive rice-fields; dry crops: gram, cotton, ragi, gingelly, castor-oil, mustard, chillies, beans, gourds, pumpkins, and tobacco.

*Trees*.—Bhér, ippa, tamarind, mango, jack, fig; soil, lighter than before, more sand in it.

Village of *Bólaspúr*, with a *tanb*. Then jungle again with a few patches of wet and dry cultivation; some rock. From here tracks lead to Bánpúr (N.E.) and Dádpúr (S.W.)

4th mile.—A small stream requiring a bridge 18 feet span  $\times$  9 feet high; sandy bed, good banks; jungle again.

*Domsildt*.—Half a dozen huts in the jungle, with a few fields; then dense jungle on light soil; the sand on the track shining with small particles of quartz and feldspar, and dust of mica and pyrites.

*Torla*.—Five huts in a small clearing surrounded by jungle.

Six miles 7 furlongs, crossed the *Dhéron stream*, 65 feet wide between the banks which are 7 feet high and occasionally flooded to a further depth of 7 feet for some distance. Total width 162 feet, depth 14 feet. The railway would keep on the right bank of the stream, near *Kokormal*, and cross a mile to the east of *Kandel*.

*Korlakuta*.—A dozen huts in a jungle clearing, with a few fields; then jungle; much kunker limestone is here lying about the surface.

*Kandel*.—A dozen huts in a large clearing in the jungle. A few rice-fields and some dry crops.

The river to be crossed a mile east of Kandel is 245 feet wide and 16 feet deep in flood, when the low banks which are about 8 feet high are covered to a further depth of 8 feet for some distance. The bed is sandy, no rock visible. Five 50-foot arches, crown 20 feet above deep bed, will be required. A few fields cultivated; then jungle again; soil, light clay with sand.

*Dammermurra*.—A few huts in a small cleared space surrounded by jungle. A crude "still" for the manufacture of alcoholic liquor from the flowers of the ippa tree was at work here. There are very few fields about the place; jungle again.

*Limpura*.—Some open ground and a few fields; some sugarcane, then light jungle. A small nullah 11 feet  $\times$  4 feet. A *tanb* with rice-fields under it; then *Bógor*, 12 miles 4 furlongs.

1st December.—*Bógor*. Thermometer 6 A.M. 47° F.

Mr. Cormac arrived from Bondesor; all well in his camp, except one lascar and one mahout who have fever. Mr. Cormac's report and notes of reconnaissance taken during his march, as well as a section of the country gone over by him, accompany this. We are busy with accounts, reports, maps, observation of instruments, calculations of altitudes, &c., and with general camp duties. The weather is fine; the nights are cold.

Fever begins to prevail in the camp; the Dresser, the Hospital Servant, the Writer, one Police Constable, three Lascars and several servants are laid up with it.

There is much white and reddish quartz about here; my camp stands on a bed of gneiss and quartz. A hill near this consists of the same minerals. There is also some porphyritic granite, with feldspar in large crystals, thickly scattered over the surface in white blotches, often rectangular in shape. The quartz is full of shining specks, white and yellow, leaflets that can be detached with a pen-knife, probably mica and pyrites, as well as glistening grains of some metal, and little nodules of peroxyde of iron embedded in the quartz. I will forward from Raipur a few samples, both pulverized and solid, for chemical analysis and assay, if it be considered worth while to have this done.

Despatched a messenger, one of the men from Bondesor, to the Zemindar at Kariál to see about arrangements for supplies, coolies, &c., en route to that place, as nothing seems to have been arranged so far by the Kariál people, and without their authority nothing is to be had.

2nd December, *Bógor*. Thermometer 6 A.M. 49° F.

Occupied with office duties, as yesterday.

3rd December, *Bógor*. Thermometer 6 A.M. 49° F. Went out to examine the *Tél river* and to find a suitable crossing. The bed is treacherous and will in some places not support the weight of horse and man.

No tappal received in camp for more than a fortnight.

BÓGOR,  
4th December 1881.

K. F. NORDMANN,  
Executive Engineer on Special Duty.



## IX.

## MR. CORMAC'S REPORTS.

18th November, camp Comellyphettah; height 703 feet above M.S.L.

Distance from Ryaguddah, 5 miles 2 furlongs 176 yards.

At one-eighth mile crossed a river (50 feet  $\times$  9 feet) with stony bed, banks not well defined. Passed a Khónd village (Santally)  $1\frac{1}{4}$  miles from Comellyphettah; from that village the country is broken by ravines; low jungle prevails and continues to Coormpettah, a large village principally of Telugu people.

The country here is well cultivated, soil light and sandy, the hills on the west are well wooded, and are about one mile distant. Camped at Dorabada, where there is a large area under wet cultivation. The track to this point runs about one mile from the hills and parallel with them. There is a good camping ground beyond the village and a well of good drinking water. The land in the vicinity is fully cultivated and well irrigated; the villages round about, as well as this, are peopled with immigrants from the Kurupam taluk near Parvatipuram.

19th November, camp Dorabada; height 835 feet above M.S.L.

Distance from Comellyphettah, 7 miles.

Difference in altitude + 132 feet.

Passed along the foot of the hills to the west of the valley through well cultivated land (chiefly dry cultivation), the ground having a slight inclination to the east. About 3 miles from Dorabada the track crosses several deep ravines and much broken ground with patches of dry cultivation here and there. At  $7\frac{1}{4}$  miles from Dorabada the track runs parallel with the Nágavully river, and crossing a large stream (138 feet  $\times$  8 feet, banks not well defined, bed stony) at  $8\frac{1}{2}$  miles distance, enters upon a fine open valley where there is a good camping ground and good drinking water near the village of Shikárpoy; there is a large sugarcane plantation at this place, and the country round about is well cultivated; the rice crop which covered a large area has been harvested.

20th November, camp Shikárpoy; height above M.S.L. 992 feet.

Distance from Dorabada, 9 miles 1 furlong.

Difference of altitude + 157 feet.

The track from this village runs nearly parallel with the Nágavully river up to Singapore; the river valley is about 2 miles across, and the cross section is almost level. Fully two-thirds of the valley is under cultivation, chiefly dry crops. Four streams, one requiring a span of 15 feet, one of 16 feet, and two of 20 feet were crossed up to  $3\frac{1}{4}$  miles from Shikárpoy. Here a large stream requiring a span of 30 feet was met with; the banks of this stream are not well defined, and the bed is stony.

The village of Narainpoorum (4 miles) possesses a small pukka temple, the first seen since leaving Ryaguddah. At  $4\frac{1}{4}$  miles distance a stream requiring a span of 40 feet was crossed, banks not well defined, and bed sandy; and at  $5\frac{1}{4}$  miles another stream requiring a span of 30 feet, bed rocky, banks well defined.

At Singapore crossed the Nágavully, requiring a bridge of three openings of 40 feet each; bed sandy, banks not well defined. The produce (which is much in excess of local requirements) of the country generally from Ryaguddah to Singapore is rice, ragi, cholam, sugarcane, horse-gram, green-gram, gingelly, linseed, and hemp. The trade chiefly consists of the food-grains named previously and gingelly, castor-oil, hemp, linseed and hides; the track followed by me is the trade route from Junágar and Bondesor. In the forests the timber chiefly found is jack, yégi, matti, ippa, mango, and blackwood.

At Singapore ordinary smiths and carpenters are obtainable, their hire being 4 and 5 annas per day, ordinary cooly hire is  $1\frac{1}{2}$  annas per man per day; this is generally paid in kind. The country is but sparsely populated, and there is space for a large number of immigrants, especially north and east of Singapore.

22nd November, camp Singapore; height above M.S.L. 997 feet.

Distance from Shikárpoy, 7 miles 2 furlongs.

Difference of altitude 5 feet.

Passed through the town of Singapore by the fort of the Rajah, a space enclosed by a mud wall about 12 feet high and 3 feet thick with a thatched coping; the buildings inside being of mud and thatched.

Beyond the town the country is open and under dry cultivation; over a large area the stumps of sál trees are still standing.

The track runs along the watershed of the San and Bodo rivers, until the San is crossed

At 4-3-190 track to Bondesor diverges. near Palkonianah; the banks of the stream which flows at the bottom of a deep ravine are not well defined, the bed is sandy, span required 70 feet  $\times$  10 feet.

At  $5\frac{1}{2}$  miles distant from camp another stream flowing at the bottom of a ravine is crossed, the bed is rocky, and banks not well defined; between these two streams lies the village of Palkonianah, round which there is a large area of dry cultivation. After crossing the

Here see section from Palkonianah to Lonjigar.

stream the track enters dense jungle, and crosses several smaller streams, entering a clearing of about 6 acres near Tirmui, where there is a good camping ground and good water; the jungle is very thick, and it was with difficulty that the elephants passed through it.

23rd November, camp Tirmui; height above M.S.L. 1,602 feet.

Distance from Singapore, 10 miles 5 furlongs.

Difference of altitude + 605 feet.

On leaving camp, entered dense jungle which continued for  $3\frac{1}{2}$  miles, when the village of Narraindong was reached; the country from this place is well cultivated and under sugarcane, and rice quite up to Lonjigar, where a halt was made. Just before entering Lonjigar, the Bongsdara was crossed, banks are well defined, and the bed stony, requiring a span of 40 feet  $\times$  12 feet. The forest abounds with sál, yégi, matti, jack, mango, ippa, and blackwood trees; the soil is rich loam, except at the small ghâts where it is rocky. The track is evidently not much used, and probably only the produce of the south of the Lonjigar valley is conveyed by this route.

The country from Singapore to Lonjigar is very thinly populated, and there is ample room for a large number of immigrants. The crops produced are chiefly rice, ragi, gram and sugarcane. There is a good camping ground, and good water obtainable.

26th November, camp Palkonianah; height above M.S.L. 1,158 feet.

Distance from Singapore, 4 miles 4 furlongs.

Difference of altitude 161 feet.

Skirted the side of a hill, through jungle, for five-eighths of a mile, passing south of the village of Chothopoor which is surrounded by wet cultivation; and at  $1\frac{1}{4}$  miles passed through low jungle with a small patch of dry cultivation on the south.

At  $1\frac{1}{2}$  miles crossed low ground under paddy cultivation and entered the village of Moondeegoodah; here met hides coming from Junágar.

At  $2\frac{3}{4}$  miles joined the regular track of the Brinjarries from Singapore; this track lies on the watershed of the Bodo and the San rivers and has a very gradual ascent.

At  $2\frac{1}{2}$  miles distance crossed the San river (banks well defined, bed sandy, and requiring a waterway of 60 feet  $\times$  10 feet), passed up the valley (about half a mile broad and with an almost level cross section) of a small stream up to a low saddle, skirted the side of a hill, crossed a second saddle and entered upon a wide open valley (well cultivated) in which stands the village of Bijepur. The ascent to this is very gradual and might be made practicable for carts at a small cost. The track continues along the valley (ascent very gradual) which is broad and open and nearly level across up to spot marked Nisanpur on the map, where the camp was pitched. Up to this the country from Bijepur is well cultivated, both wet and dry, the dry being chiefly lamp-oil seeds. The soil is a sandy, reddish clay, camping ground good and good water procurable. The hills on each side of the valley are well wooded, and several topes of large mango trees were passed.

27th November, camp near Kundru; height above M.S.L. 1,757 feet.

Distance from Palkonianah, 9 miles 4 furlongs.

Difference of altitude + 599 feet.

Left camp, proceeding up the valley of the Kundru stream, which is crossed several times by the track (but which may be avoided) through dense jungle (which had to be cut to permit the passage of the elephants) to the head of the Músa ghât, which is 2,047 feet above mean sea level.

With the exception of the last furlong, the ascent is so gradual that the track may be made practicable for wheeled traffic for a small outlay, and no difficulty will be experienced in the last furlong. From the ghât head, on the Bondesor side, the gradient is very steep for  $1\frac{1}{2}$ th miles to the foot, whence it runs with a gradual descent for four miles through dense jungle to the camping ground. Good water is procurable, and the camping ground is good.

Owing to the heavy jungle, it was not possible to see much; but from what was observed of the hills, the difficulties attending the opening out of a good ghât road, with a gradient of 1 in 22, will be very slight, as apparently little more than earthwork will be necessary.

28th November, camp Majigaon; height above M.S.L. 915 feet.

Distance from near Kundru, 6 miles 6 furlongs.

Difference of altitude 842 feet.

Left camp along the valley of the Patna river which was crossed about 5 miles distant, and proceeded nearly parallel with the course of the Simli Jor which was crossed near Beheragura, about  $9\frac{1}{4}$  miles from last camp; all this distance was traversed through dense jungle, passing only two small patches of cultivation.

The village of Beheragura stands in an open piece of ground, but there is very little cultivation near it, and it has the appearance of being almost deserted. From thence the track continues through low jungle quite up to Bondesor, where there is an excellent camping ground; good drinking water has to be brought from a distance.

Between the foot of the Músa ghât and Beheragura there is a large area of land available for immigrants; the soil is good and fertile.

In the forest one matti tree was measured and found to be 13 feet in circumference, 6 feet above the ground; there is sál, jack, yégi, ippa and mango in any quantity, and also small bamboo.

Limestone is procurable (nodular kunker) in abundance; iron is found and worked in Bondesor, nearly every person met being armed with an axe of local manufacture.

The climate is said to be unhealthy, but with so much jungle this may be expected; the working season would be from November to July; the country would be difficult to travel in during the remainder of the year on account of the rains.



The chief *trade* is in rice, gingelly, Bengal gram and linseed; this is chiefly exported from Junágar, the route to that place diverges to the west about 9 miles south of Bondesor.

Fully 600 Brinjarries pack-bullocks were met from Junágar this day with rice and Bengal gram, and about 200 (empty) on their way to the same place.

A few *bricklayers*, carpenters and stone-cutters, live at Bondesor, and are said to receive 8 annas each per day; judging from the description of the buildings in the town, very few have been employed, as only two tiled houses were seen, besides the house of the Rajah, which is of brick in clay, but is incomplete.

The jail is a wattle-and-daub structure with a thatched roof; the prisoners (about 90) are employed in making roads; a few also make carpets.

A kind of cloth resembling Tassa silk is manufactured in this part of the country.

It was ascertained that rice is being sold in Bondesor at 50 seers per rupee, and at Singapore only 32 miles distant at 12 seers per rupee; this fact shows the necessity for improved means of communication between the two places.

The Acting Dewán of Kalahundy was exceedingly attentive and gave every assistance in his power; without his help it would have been very difficult to obtain supplies, as the villages passed are small and do not possess any bazaars.

30th November, camp Bondesor; height above M.S.L. 279 feet.

Distance from Majigaon, 11 miles 3 furlongs.

Difference in altitude 186 feet.

Proceeded through the town of Bondesor, emerging from it at three-fourths of a mile from starting point. From limit of town to 2 miles passed through wet cultivation and thence through a well-cultivated country to Bijepur, 5½ miles distant from Bondesor. From this place the country has a most deserted appearance, land previously cultivated having been abandoned.

At 7½ miles passed through the village of Dádpúr, consisting of about 200 thatched houses and with a small area under cultivation near the village. The country is partially cleared of jungle where not cultivated, and heavy jungle is not seen except on the hills.

At 8½ miles beyond Dádpúr crossed a small ghát through thick jungle, and at 4½ miles crossed a river with sandy bed and well-defined banks, requiring a waterway of 80 feet × 15 feet. There is a good *camping ground* and good water at Komári; country more or less rocky.

1st December, camp Komári; height above M.S.L. 558 feet.

Distance from Bondesor, 13 miles 5 furlongs.

Difference of altitude 171 feet.

On leaving Komári, passed through patches of cultivated land, surrounded by partially clear jungle; the appearance of the country here gives the impression that it has been more populous, but has been deserted, there being traces of cultivation all along.

At 2½ miles crossed a stream with stony bed, and banks not well defined, requiring a waterway of 50 feet × 6 feet.

Up to 3½ miles passed through country covered with long grass, at *Jujrang*, (3½ miles) where patches of cultivated land and partially cleared jungle continued to 5½ miles, up to the village of *Uthekela*, round which also is some cultivated land.

At 8½ miles passed the village of Boria, on high ground; open country all round, and wet cultivation to east.

At 9½ miles crossed a river, the *Ret Noi*, with sandy bed and well-defined banks, requiring a waterway of 250 feet × 15 feet.

At 13 miles 2 furlongs reached Bógor; height above M.S.L. 628 feet.

Along the last five miles of this journey a tolerably level road was traversed, without any surface covering of gravel or metal, but with side drains and recently planted avenue trees at intervals; this road runs from Bondesor to Sumbulpoor, and is said to be fairly practicable for carts.

Bógor,

4th December 1881.

J. CORMAC,

Sub-Engineer.

K. F. NORDMANN,

Executive Engineer on Special Duty.

## X.

No. 24R., dated Raipúr, the 6th January 1882.

From—K. F. NORDMANN, Esq., Executive Engineer, on Special Duty,

To—The Secretary to the Government of Madras, Public Works Dept.

*Submits Report of Reconnaissance from 5th to 30th December, with Sections.*—I have the honor herewith to submit the report on the reconnaissance from Bógor to Raipúr (5th to 30th December 1881), together with an extract from my notes taken *en route*.

The sections will follow in a few days, *i.e.*, as soon as all the aneroid observations, taken on the coast up to date, have been received. I request that all the altitudes, entered in my previous reports, may now be corrected according to the figures given in the sections, which are final and accurate.

2. *March from Bógor to Onki.*—The party crossed the Tél Nadi near Bógor on the 6th December, and marched along the left bank of the Sunder river, *viá* Bodkapodór, Badbeng, Túkla, Kariál, Kolinga, Kúmúna to Torbor, thence across a low watershed and through some very dense jungle, *viá* Kandamuri, Sialjóri and Jalbal, into the valley of the Jong river, and along its right bank to Onki.

3. *From Jalbal to Raipúr.*—Returning from Onki to Jalbal, the reconnaissance was continued *viá* Nara, Súarmál, Kopli, Batrapáli, Telibanda, Umarda, Mahásamund, Kharóra and Belsóra to Gorári, where the Mahánadi was crossed; thence to Arang, where I halted a few days to give the people and cattle some rest, and then along the Sumbulpoor road to Raipúr, the distance of which from Vizagapatam by this route is 372 miles.

4. *Crossing of the Mahánadi.*—Gorári is the best place to cross the Mahánadi about here, as the banks are well defined, and the river is not so wide as in the adjoining reaches above and below.

There is a still better crossing near Lound, some 50 miles north-east of Arang, but it is too far away from this line.

5. *General character of the line.*—The ground traversed all the way from Bógor to Onki, and from Jalbal to Raipúr has been, practically, almost level; that is to say, the slopes have been very easy, and the gradient need never exceed 1 in 100. Bógor is 628 feet and Raipúr 962 feet above sea level.

The greatest elevation reached between the two places is at Bagbáhra, *viz.*, 1,084 feet; while Onki is 899 feet above mean sea level. The entire route is perfectly easy, there is no obstacle of any sort for either road or railway, and there are only three large rivers to be crossed, named the Tél Nadi, the Jong and the Mahánadi.

6. *Building materials, labour, soil, wet and dry crops.*—Building materials, such as stone, timber, clay and sand, limestone and iron, are abundant; and labour is to be had to such an extent as the somewhat sparsely populated jungles will admit.

The soil is rich throughout; rice and sugarcane, besides the ordinary dry crops, are grown along the whole line; the irrigation expedients for the wet crops being of the most primitive kind, yet quite sufficient.

7. *Recommends that the line viá the Músa Ghát and Bondesór be finally rejected.*—I have already recommended (in my letter No. 20B., dated 4th December 1881, paragraphs 4 to 6,) that the line *viá* Bondesór may be rejected for the purposes of the proposed railway, owing to the obstructions offered by the Músa Ghát; likewise the Lonjigar line, on account of the high elevation attained, (upwards of 1,600 feet) at Tirmui.—Hence, if the railway is to be taken east of the Noagarh Hills, the Ombadóla line seems the best.

8. *A line from Asurgor to Sónpoor and Sumbulpoor.*—It is apt to strike any one looking at the map that, having arrived at Asurgor, this line seems naturally to trend in a northerly direction to Sónpoor and Sumbulpoor (crossing the Tél Nadi near Turla), rather than to Onki or Raipúr. Asurgor is about 125 miles from Sumbulpoor, nearly the same distance from Onki, and 180 miles from Raipúr; so that by joining the Chattisgarh line at Sumbulpoor or Onki, instead of Raipúr, a saving of 55 miles could be effected. But, so long as it is not definitely settled whether the railway from Nandgáon (the present terminus of the Nagpúr-Chattisgarh line) is to come to Raipúr at all and cross the Mahánadi twice, at Arang and Sumbulpoor, or to go to Bélaspur without crossing the river, it seems premature to discuss the merits of a line from Asurgor to Onki or to Sumbulpoor.

9. *The route recommended by the Commissioner of the Chattisgarh Division.*—As regards the route travelled over by the Commissioner, Colonel Lucie-Smith (alluded to in the papers which accompany G. O. No. 3025 W., dated 5th December 1881), that portion of it from Bondesór to Polsodar may now perhaps be left out of consideration, since the railway is not intended, I think, to cross the Músa Ghát, and consequently will not touch Bondesór. From Polsodar to 5 miles north of Torbor, a distance of about 30 miles, the route traversed by the Commissioner coincides with my line; as does also that portion from Mahásamund to Raipúr, another 30 miles.



The only part of the route, where his line deviates from mine, is that between Tarnot and Mahásamund, about 45 miles; his line going from Torbor *viâ* Limdi, Tarnot, Sarabong, Tendubarra, Sirgidi, Bodrabanda, Kamaria and Karti, while mine (which may be 5 miles longer than the former) proceeds *viâ* Sialjóri, Jalbal, Nara, Súarmál, Bagbáhra Patrapáli, Telibanda and Umarda to Mahásamund.

10. *Objections to the above route.*—Although the line travelled over by the Commissioner may be unobjectionable for an ordinary cart road, yet for the purposes of a railway there are two obstructions in the way. These are a small ghât 2 miles south of Tarnot, between that place and Góbra, and a heavier ghât at Sirgidi, where Colonel Lucie-Smith says that he had attained an altitude of 1,500 feet. These two small ghâts, I consider, offer sufficient grounds for rejecting that line for a railway, when an easier line without any ghât is available by making a slight *détour*.

I was informed of the Tarnot and Sirgidi line by the Rajah of Kariál (as mentioned in my notes dated 9th December), but from the description I heard of it I did not consider it a suitable line for a railway, and hence did not reconnoitre it.

11. *Faulty Tappal arrangements at Ryaguddah, and delay in receipt of telegram, dated 1st December.*—If I had received G.O., No. 3025 W., dated 5th December 1881, and your telegram, dated 1st December, in time, I should nevertheless have examined this line; but the tappal arrangements made at Ryaguddah were very faulty.

No letters or papers reached me for nearly six weeks, *i.e.*, from 14th November to 23rd December, on which date the printed Government Order, alluded to, containing your telegram, was delivered to me. This was the first intimation I had of the despatch of that telegram. A copy of the telegram, posted at Madras on the 1st, which had been to Ryaguddah and thence returned to Vizagapatam, reached me only on the 26th December at Arang. I had then left Bondesór, 150 miles behind me; and, looking to the work still to be done between this and the hot weather, and the uncertain state of the health of my establishment, I thought I should not be doing the right thing if I turned back, or sent Mr. Cormac back, the more so since I had already pronounced against the line in question.

12. *Consultation with the Chief Commissioner, Central Provinces, and the Commissioner, Chattisgarh Division.*—I went to see the Chief Commissioner of the Central Provinces, Mr. Morris, who was here on tour, and the Commissioner of the Chattisgarh Division, Colonel Lucie-Smith, as soon as I reached Raipúr on the 30th, and explained my views with regard to the Músa Ghât and the route *viâ* Tarnot and Sirgidi; and I believe both these gentlemen agree with me that, although the latter route may be very suitable for a road, it is objectionable for a railway, on account of considerable ascents and descents and the high altitude attained, while there is an easier route running parallel to it which is but very little longer.

13. *Readiness of Native Chiefs to forward the post.*—I do not know who is to blame for the faulty tappal arrangements at Ryaguddah. I believe the Sub-Magistrate there had orders from the Collector of Vizagapatam to forward the post after me, and I instructed him to despatch a post twice a week; but he only did so until I reached Ombadola, not after that; although the Tât Rajah at Bisemkattak and the Zamin at Ombadola were quite prepared and willing to send letters to follow me as far as Kárial; while the Bondesór Ráni would have sent them on to Raipúr, if necessary. A Bondesór Policeman actually walked 120 miles through the jungle in four days and brought me a letter (*vide* "Notes," dated 20th December), which had been sent by the Commissioner of Chattisgarh Division *viâ* Sumbulpoor, and had been delayed *en route*.

14. *Traffic along the route.*—On the whole I have not met much bullock traffic on the route traversed; but this may be owing to the season, just after the monsoon, when the crops have only just been harvested. However, from my own recollection, the traffic from Raipúr, Nagpúr, and Bustar, *viâ* Jeypur and Potinghy, and down the several ghâts in that direction, is very much heavier than by this route.

15. *Acknowledgment of assistance rendered to the party.*—I have to record my obligations to the Jeypur Rajah's Amins at Ryaguddah and Ombadola, the Tāt Rajah at Bisemkattah and his Kotwal; the Police Inspector of Bisemkattah; the headman of Bógor village; the Ráni of Bhavanipatnam (Bondesor), her Dewán and other officials; the Rajah of Patna; the Rajah of Kariál and his most obliging police officers; and the zamindars of Nara and Súarmál, for their readiness to assist the reconnoitring party in every way, with information, guides, coolies, camp supplies, &c. Without their willing aid it would have been very difficult indeed to traverse those wilds. Even so it was sometimes very trying work to push on, without unnecessary delay, through almost trackless jungles, with such a large camp, the sick having to be carried in improvised dhoolies; but we managed to push through without losing a man, and attended to our survey. Mr. Sub-Engineer Cormac has given me most valuable assistance during the whole journey, and the Hospital Assistant, P. V. Ramaswamy Naidu, has looked well after the sick.

16. *Another set of Ordnance Maps asked for.*—I beg to request that another set of ordnance maps (scale 4 miles to the inch), comprising the sheets containing Raipúr, Sumbulpoor, Jeypur, Vizagapatam and the intermediate country, may be mounted in one large map on rollers (similarly as I have had the first set mounted), so that I may on my return mark thereon the lines traversed and the exact location of the proposed Railway by the several routes; since the map with me is somewhat the worse for wear, and I have only been supplied with one set of maps, but not with the duplicates, as mentioned in paragraph 8 of G.O. No. 2294 W., dated 16th September 1881.

17. *Two more Aneroids wanted.*—I also request that two fresh aneroid barometers may be sent to Nárangpur, to await my arrival there, as two of my aneroids have become unreliable.

18. *Letters how to be addressed.*—Letters despatched after the 15th instant should likewise be addressed to "Nárangpur, care of the Postmaster, to await arrival." I have made arrangements for letters to be sent after me from Raipúr as far as Noagarh.

19. *Proposed details of reconnaissance from Raipúr southwards.*—The reconnoitring party will leave Raipúr in a few days, as soon as all the office work that has to be done is disposed of. Mr. Cormac's party will march *viá* Dhamtari and Kankéir through a corner of Bustar, *viá* Banskót to Omorkót, while I shall proceed *viá* Rajim, Kopra, Paregáon and Noagarh to Raigarh and Omorkót; thence we march together to Nárangpur where I expect to be about the 8th February, reaching Kuraputi about the 14th idem. At Kuraputi I propose to halt a week or ten days to bring up arrears of reports, sections, &c.

20. *The Revenue Subordinate not yet joined.*—A Revenue Subordinate (as provided for in paragraph 15 of G.O. No. 2294 W., dated 16th September 1881) has not yet joined the reconnoitring party.

The Agent at Vizagapatam states, under date the 2nd December, that he has been unable to find a qualified gumastah, and that he has telegraphed to the Agent in Ganjam to send me a man who knows the necessary languages.

Nothing further has been heard on the subject.

Meanwhile I have had to employ two inferior men, one from Párvatipuram, the other from Ryaguddah, who between them share the pay intended for the qualified gumastah; one of these men is attached to Mr. Cormac's party and one to my own.

## XI.

*Extract from Notes of Reconnaissance from 5th to 30th December 1881.—Bógor to Raipúr, distance 166 miles.*

*Bógor, 5th December 1881.*—Thermometer 6 A.M., 48°; 10-30, 65°; 4 P.M., 77°. Despatched one camp ahead.

Received a letter from the Officiating Dewán of Bondesor, saying that a parwána (order) from Sumbulpoor, dated 14th ultimo, to render assistance to the party, had reached him only on the 1st December, and that Her Highness the Maharáni had directed him to send orders along the route to Kariál accordingly.

The Dewán sent a specimen of a metallic ore, found near Bondesor, containing antimony and graphite; he also sent some rose-coloured stones (probably spinel rubies) found near



Manjhér. Among the fruit, vegetables, pastry, &c., politely sent by the Maharáni of Bondesor, were some very delicate leafy cake of the finest texture, some sweet large yellow oranges with loose coats, besides tomatoes, radishes, knoll-kohl, yam, spinage, and large brinjals the size of melons.

The Dewán and the young Rajah's tutor are the only English-speaking persons in Bondesor. The Rani and her officers and policemen have been most attentive in providing camp supplies, guides and coolies.

*From Bógor to Karídl.*—Distance 38 miles, 3 furlongs.—*December 6th, Bógor to Bodkapodór.*—8 miles, 7 furlongs. Thermometer 6 A.M., 50°; 11 A.M., 77°; 4 P.M., 78°.

*1 mile, 5 furlongs; bank of the Tél Nadi.*—We had to wade through the river, as the sand was too soft and yielding for riding. The river from bank to bank is 1,560 feet wide and 20 to 25 feet deep between the banks; but these are flooded in heavy monsoons to a further depth of 5 feet at least, so that the bridge would have to be quite 35 feet above the deep bed. On one bank there is rock visible which probably extends across the river not very deep below the sandy bed.

*2 miles, 7 furlongs, village of Móhda.*—Wet and dry cultivation.

Soil.—Heavy clay, with some sand and some gravel.

Crops.—Cotton, gram, gingelly, lamp-oil, castor-oil, ragi, mustard, tobacco, vegetables, paddy and sugarcane.

*Dungripára.*—Some dry cultivation; country open.

*Gontaballi.*—Like most of the villages here, built upon a high and dry site. The ground is somewhat undulating; the open country with its scattered trees has a park-like appearance; there is a little light scrub jungle; good grass land.

*Serko.*—Fine, open country; high and dry ground; hard soil; many trees about.

*6 miles, 106 yards.*—A stream flowing into the Sunder river. This stream is not marked on the map. It is 9 feet deep and 50 feet wide in flood; high banks and sandy bed; no rock visible.

Open grass country, with some trees and shrubs, and some cultivation. Half a mile further, the large village of *Udepúr*.

There is a peculiar *temple* here, and another at Gurár, a little further on. The structure is built of stone in the shape of a flask with broad stopper; or a lime kiln with a crown or cap,\* about 20 feet high, with the greatest diameter 8 feet, and a door 2 feet  $\times$  5 feet. The top ornament, resembling the stopper or cap, is a single flat stone carved at the edges, about 5 feet in diameter and a foot thick.

*7 miles, 3 furlongs. Gurár.*—Large village; five tanks; sugarcane, rice and dry crops; much garden cultivation by means of numerous *wells*, 3 feet in diameter, 15 to 20 feet deep, worked by a kind of picota; the mouth of the well mostly unprotected. Soil, light.

*8 miles, 7 furlongs, Bodkapodór.*—Good camping ground. Light sandy soil.

A rich metallic ore crops out in masses above the surface, containing much pyrites, mica, iron; and to all appearance copper, antimony, bismuth, arsenic, traces of silver, and probably gold. Specimens will be sent from Raipur.—Height of Bodkapodór above mean sea level, nearly the same as Bógor, viz., 618 feet.

Distance of Bodkopodór from Vizagapatam 214 miles; from Raipur about 151 miles. The country is better cultivated here; the villages are larger, and there is less jungle about than I have met hitherto since leaving Ryaguddah; the people are more civilized too, they stipulated for payment for labour, supplies, &c., beforehand, whereas further south they were satisfied with what they received, and frequently did not ask for payment, sometimes even refused it when proffered.

*December 7th.*—*Bodkapodór to Sorman.*—Distance 11 miles, 7 furlongs. Thermometer 6 A.M., 53°; 11 A.M., 81°; 4 P.M., 79°. In the first mile a stream, from which a small irrigation channel is taken off. Bed sandy, one bank high, the other low, alternately; no rock visible; greatest width and depth in flood 110 feet and 9 feet respectively.

*2 miles, 7 furlongs, 116 yards. Kuland.*—A large village, with extensive cultivated fields, both wet and dry.

The country open, no jungle here; a *mango tope* near the village; also two tanks, one large, the other smaller. The country here looks prosperous, and the people (who are dressed to some extent) look well-to-do.

Almost all the ground, except the hill sides, is cultivated; there is scarcely any waste land to be seen in the plain.

After this the ground rises and becomes undulating; there is less cultivation, and some light scrub jungle.—At 4 miles 2 furlongs, there is a sheet rock composed of a kind of conglomerate with metallic lustre and traces of iron and copper.

Kunkur limestone is found all over the country.

The railway line from Bógor should hug the northern bank of the Sunder river, keeping an average distance of half a mile or so from it, as the ground further north rises rather rapidly towards the hills and is undulating and in places somewhat irregular.

*Gondergura.*—Village with a large tank; rocky hillocks dotted about.

*5 miles, 2 furlongs, 144 yards.*—A stream with perpendicular banks, 8 feet high, and sandy bed; no rock. Width and depth in flood 110 feet and 7 feet, respectively.

\* Somewhat like the tomb-stones in the cemetery of Seutari.

Village of *Dablon*, small; little cultivation; some jungle; hilly and undulating ground; soil, dark clay.

7 miles, 4 furlongs. Village of *Itchegdon*.—Wet and dry fields; soil, dark clay with some sand. Open, flat country.

Then a *tank*.—Then the Village of *Porsasora*, with tank and tope; light soil; good camping ground.

All the villages about here are built on rising ground. Ground slightly undulating.

9 miles, 3 furlongs. *Bálbeng*.—Large village; there are *weavers* here.

11 miles, 7 furlongs. *Sorman*.—A small place, at the foot of a hill; supplies scanty. Much wet cultivation in the lower grounds towards the river. Height of *Sorman* above mean sea level 638 feet. Distance from *Vizagapatam* 226 miles 2 furlongs; from *Raipur* about 139 miles.

A Policeman from *Bishapatnam* (on the map called *Sindikola*) 2 miles from here, belonging to the *Patna Zemindar's* establishment, came to see about supplies, &c.—Much fever in camp; ten to twelve people more or less laid up with it; some have to be carried on the elephants and in dhoolies.

One of the large tents from *Coimbatore* (that had been blown down in the rains at *Bisemkattak*, had one pole and the ridge piece broken and was temporarily repaired at *Ombadola*) got out of order again, and the ridge piece required further repair before the tent could be pitched.

8th December.—*Sorman to Tukla*.—Distance 10 miles 1 furlong. Thermometer, 6 A.M., 52°; 11 A.M., 78°; 4 P.M., 77°.

1 mile, 6 furlongs. *Bishapatnam*.—Large village belonging to the *Patna Zemindar*.

Police station.—Open country, well cultivated; dark clayey soil, rock cropping up in several places; gneiss, decayed near the surface; and conglomerate.

3 miles, 7 furlongs, 125 yards. *Sáleburt*.—Large village with broad fields; a tope, good camping ground.

5½ miles. *Jholop*.—Wet and dry fields; large gardens with wells; tank, top and camping ground; soil gravelly.

A remarkable hill of *white quartz* half a mile south of the village; also quartz in large masses cropping out in several places; the village stands on quartz; the large reef, of which these outcrops evidently form part, runs from north to south.

6 miles, 7 furlongs. *Boslar*.—Some cultivation, and some waste land with light scrub jungle.

8 miles, 1 furlong. The *Buásan stream* with low banks and sandy bed; width between banks 145 feet, depth 6 feet, which depth during high floods, when the banks are overtopped, increases to 13 feet; the width during such floods is not easily ascertainable; the country around is then flooded by water of the *Sunder river* which is quite near.

10 miles, 130 yards. *Tukla*.—Large village with tank and topes; open flat country, good camping ground for a small army; light soil; water from wells, tank and river. Supplies procurable.

Two officials, sent by the *Zemindar of Kariál*, were here to attend to camp supplies, &c.

Height of *Tukla* above mean sea level 686 feet; rise from last camp 48 feet.

Distance of *Tukla* from *Vizagapatam* 236 miles, 2 furlongs; from *Raipur* about 129 miles.

The people here speak *Maráthi*, *Hindí*, and *Ooriya*.

There are many *weavers* in *Tukla* and the neighbouring village of *Risga*, making a coarse cotton cloth; as well as *Tassa silk*, which sells here for about 6 annas a yard.

December 9th.—*Tukla to Kariál*.—Distance 7½ miles. *Kariál* is the largest village met with since *Párvatipuram*; it is said to have 400 houses and about 2,000 inhabitants.

The *Zemindar* or *Rajah* of a large estate resides here.

Thermometer, 6 A.M., 52°; 11 A.M., 72°; 4 P.M., 77°.

1 mile, 183 yards. *Risga*.—Large village where *Tassa silk* is manufactured; open country; wet and dry fields; topes and trees; then some scrub jungle. The railway must continue to keep near the river bank, as far as *San Doil*, as the ground to the north of the river is high and irregular.

2½ miles. *Pokansor*.—Wet and dry cultivation as before; black soil; numerous cattle.

3½ miles. *Bóro Doil*.—Soil, rich dark clay. Then *San Doil*; some light jungle.

At 5 miles 3 furlongs, a large tank, near the village of *Ránpur*, constructed by the *Rajah* of *Kariál*, upon springy ground; the drainage from the hills being excluded. The tank is for drinking water only; there is no irrigation from it.

It measures about 500 feet square and is 6 feet to 9 feet deep.—Here the *Rajah's* son, a fine young man of 24 years, richly dressed, with a younger brother, and a retinue of a dozen armed men, some well mounted and in becoming native costume, and some on foot in red coats of the 16th Regiment, met us and escorted us into the town.

7 miles, 4 furlongs. *Kariál*.—Distance from *Vizagapatam* 243 miles, 6 furlongs, 116 yards; from *Raipur* about 122 miles.

In the afternoon we visited the *Rajah Padmanabha Singh*, who is a polite and pleasant elderly gentleman, somewhat infirm. His son had come to camp to invite and escort us. The *Rajah* has horses and elephants and keeps 40 sepoys; there is a small menagerie, in which besides other animals a large tiger is kept. The *Rajah's* house is in the native style, not an



imposing edifice; near it is a small flower garden after the English pattern. There is only one person here who speaks English: a Baboo from Calcutta, who is tutor, Secretary, Interpreter, Gumastah, &c.

The last European who has been here was the Deputy Commissioner from Raipur, eight months ago; he is again expected in February. The Commissioner is said to be on his tour from Raipur, *via* Sumbulpoor, to Bondesor, where the Rani has received notice of his visit.

The Rajah Padmanabha Singh expressed himself pleased with the prospect of a railway through his country.

*Trades and manufactures.*—There are carpenters, blacksmiths, and weavers (both of cloth and silk) in Kariál; also jewellers, gold and silver smiths, tailors, dhobies, and barbers; but no shoemakers; saddlery, shoes, boots, sandals, &c., have to be procured from Raipur by those who use them.

There are good sized donkeys here, the first I have seen for a long time; also crows, which are not found in the small villages in the jungle I have passed through.

Cattle are numerous, and a good many ponies are seen about here. There is a local *Post Office* belonging to the Rajah's establishment. Letters are said to take ten days to reach Raipur; one man takes the post right through.

The ordinary traffic route to Raipur lies *via* Kumuna, Torbor, Tarnot (here called Khóla), Sarabong, Sirgidi, Charbati, Kamaria, Kárti (Police Station and local Post Office), Mahásamund, Gorári, and Arang.

By this route it is reckoned an eight days' journey from here to Raipur, at the rate of 15 miles a day, or about 120 miles; by the proposed railway line it will be but little (perhaps 5 miles) more.

The railway cannot conveniently follow the ordinary traffic route, because the latter crosses two gháts, one 2 miles south of Tarnot, and the other near Sirgidi.

Height of Kariál above mean sea level, 802 feet.—Rise from Tukla, 116 feet.

Distance of Kariál from Vizagapatam 243 miles, 6 furlongs; from Raipur about 125 miles.

10th December.—*Kariál.*—Thermometer, 6 A.M., 52°; 11 A.M., 68°; 4 P.M., 78°.

I despatched one camp to Tikali, 12 miles ahead. In the afternoon the Rajah Padmanabha Singh (who succeeded his elder brother on the Musnud some sixteen years ago) and his son came on an elephant to visit me. We had some friendly conversation; the Rajah again expressed himself pleased with the prospect of a railway, and asked whether Kariál would be a station, where the station would be located, &c. His son asked questions about the fate of the unfortunate Rajah of Pooree, who was tried and imprisoned last year and who is a friend of this family. The Rajah ordered his officials to pay every attention to the wants of the expedition.

The ridge pole of the large Coimbatore tent, which had been broken and repaired at Bismkattak and Sorman and was again in want of repair, was here renewed during the night by the Rajah's order. There are ten to twelve fever cases in the camp.

The large Vizianagram elephant has sore elbows from kneeling down on stony ground when being loaded and unloaded.

Kariál is prettily situated and presents a fine oriental picture, especially when viewed from the west. The Rajah's modest palace, with its enclosure and small cupolas, the adjoining sheets of water, with date and cocoanut palms along their banks surrounded by green fields, form a pleasing scene.

11th December.—*Kariál to Tikali.*

Distance 11 miles, 7 furlongs. Thermometer . . .  $\left\{ \begin{array}{l} 6 \text{ A.M.}, 60^{\circ}. \\ 12 \text{ noon}, 87^{\circ}. \\ 4 \text{ P.M.}, 81^{\circ}. \end{array} \right.$

Outside of Kariál the jungle begins again, chiefly low scrub jungle with scarcely any cultivated fields for more than 2 miles. At 2½ miles the village of *Chindagura*, with extensive garden cultivation, mostly castor oil and tobacco; a few fields, both dry and wet. They have good cattle here, especially fine black buffaloes of large size. At the 3rd mile a stream 25 feet  $\times$  6 feet; soil swampy, banks not well defined.

3 miles, 4 furlongs. *Tonkpali.*—Very little cultivation; some margosa trees, the first seen for the last hundred miles or so. Then jungle again, which in some parts is very heavy.

5 miles, 5 furlongs. *Kódépéj.*—Much garden cultivation; castor-oil, mustard, curry vegetables, beans, pumpkins, hybiscus, gourds, and tobacco; in the fields Indian-corn, millet, cholum, and cotton; iron is manufactured here. Then some heavy jungle. A small nullah requiring a culvert 5 feet  $\times$  5 feet.

7 miles, 1 furlong. *Nuapára.*—A stream 20 feet  $\times$  6 feet close to the village is dammed up and utilized for rice-fields. Gardens and fields. Jungle again. Kunkur limestone everywhere abundant.

8 miles, 192 yards. *Borgáon.*—There is a small furnace at work here for smelting iron ore; the ore used is a brown hæmatite; it is pulverized before being put into the furnace and then smelted with charcoal. There are also potters making pots and chatties in this village.

A quartz reef crops out near it; indeed quartz is found in many places along the whole route travelled over, and much of it seems to be more or less auriferous.

The soil here is light and contains much gravel. The railway should keep near the river bank, because the ground to the east is high and undulating. Light scrub jungle and high grass. Some matti wood and stunted teak.

In the 9th mile three small streams, averaging 12 feet in width and 5 feet in depth. Light jungle.

*Shardéra*.—Light jungle; swampy ground; some rice-fields; a field with hemp or nara.

10 miles, 5 furlongs. *Kolinga*.—The low Noagarh hills visible on the left are well wooded; so also are the hills around this village.

11 miles, 7 furlongs. *Tikali*.—A few huts in a jungle clearing.—Half the lascars are laid up with fever; also several servants and some of the men belonging to the pack bullocks.

The Rajah of Kariál sent me some flowers from his garden, the first garden flowers I have seen since Párvatipuram.

Height of Tikali above mean sea level 761 feet; fall from Kariál 41 feet.

Distance of Tikali from Vizagapatam 255 miles, 5 furlongs; from Raipur about 115 miles.

Fair camping ground; drinking water from the river. No wells; they have been very rare along the entire route, so far.

12th December.—*Tikali to Kúmúna*.

Distance 10 miles, 3 furlongs. Thermometer  $\left\{ \begin{array}{l} 6 \text{ A.M.}, 60\frac{1}{2}^{\circ}. \\ 11 \text{ A.M.}, 80^{\circ}. \\ 4 \text{ P.M.}, 81^{\circ}. \end{array} \right.$

Hilly jungle, stony soil with gravel, much quartz all about.

1 mile, 6 furlongs, 112 yards. Stream 30 feet  $\times$  10 feet, high banks, rock for foundation.

Village of *Lámipani*; a little cultivation. Jungle, with much stunted teak.

3rd mile.—A stream 26 feet  $\times$  6 feet; much rock in the bed; ledges of stratified gneiss dipping at an angle of  $45^{\circ}$ , with conglomerate and quartz, extend across the stream. Jungle, rocky and stony soil. In the 4th mile, two small streams, one 6 feet  $\times$  4 feet, the other 10 feet  $\times$  5 feet. Hilly jungle.

4 miles, 4 furlongs, 128 yards.—Village of *Jalkusum*.—The railway here should keep close to the bank of the river; soil, dark and rich. A small stream, 15 feet  $\times$  5 feet, with a rocky bed.

5 miles, 7 furlongs, 115 yards.—Stream 36 feet  $\times$  9 feet; rocky bed, high banks; jungle. Here we join the Brinjarries' track from Raipur to Kariál, Dádpúr, &c.

6 miles, 6 furlongs. *Dumribahal*.—Met some 300 pack bullocks carrying gingelly seed from Raipur to Párvatipuram, Pallakonda and Nowpaula, whence they intend to bring up salt. Less jungle, and some cultivation.

7 miles, 5 furlongs. *Bilinjar*.—Tope, gardens and fields; tank; wet and dry cultivation. Jungle again on hilly ground, some very dense jungle through which a broad track 20 to 30 yards wide has been cleared for some distance.

10 miles, 3 furlongs. *Kúmúna*.—A large village, with a stone temple. Kúmúna was formerly the capital of the Kariál estate, and the late Rajah lived here; it was abandoned as a residence in favor of Kariál owing to a severe outbreak of cholera, from the effects of which the Rajah died.

Height of Kúmúna above mean sea level 857 feet; rise from Tikali 96 feet.

Distance of Kúmúna from Vizagapatam 266 miles; from Raipur about 105 miles.

13th December.—*Kúmúna to Torbor*. Thermometer  $\left\{ \begin{array}{l} 6 \text{ A.M.}, 52^{\circ}. \\ 12 \text{ noon}, 83^{\circ}. \\ 4 \text{ P.M.}, 80^{\circ}. \end{array} \right.$

Distance 12 miles, 2 furlongs, nearly all through jungle. The Kariál estate on this side consists of little else than jungle, with scarcely any inhabitants. The soil is rich almost throughout; there are hundreds of square miles that might be made to produce fine crops of wheat if the country were colonised.

At the 7th furlong, crossed the *Gurmai stream*, 60 feet wide, 15 feet deep, just below its junction with a smaller stream; one bank high, the other low, alternately; bed sandy, no rock; jungle on rich dark soil.

Site of the village of *Gursor* which has been deserted (so it is said) on account of the Brinjarries having troubled the inhabitants too much for labour and supplies. Open country; grass land with some light jungle.

Village of *Kisana*; some dry and wet cultivation.

Site of the village of *Tókapára*, deserted; jungle, grass 5 to 7 feet high; no track; rich, dark soil.—Here I saw the first partridge on this trip.

4 miles, 5 furlongs, 171 yards. *Kurisor*.—A small village; some wet and dry cultivation; soil, rich clay, nearly black.

5 miles, 3 furlongs. Stream, 36 feet  $\times$  7 feet, high banks, sandy bed, no rock.

The ruins of an old tank. The country bears evidence of having been more thickly populated in times past. Grass jungle, the grass 6 to 8 feet high; track barely visible; ground full of holes owing to the cracking and bursting of the dry black soil.

*Koirbari*.—A few huts. Some open ground, with a little cultivation; then dense jungle.

8th mile. *Jondramura*.—A deserted village, the people having left owing, it is said, to a severe outbreak of cholera eight months ago; one or two small huts remain standing and are inhabited; fine jungle all round.



9 miles, 6 furlongs. *Manikgura*.—A few huts in a small clearing in the jungle; good jungle around.

12 miles, 2 furlongs. *Torbor*.—A good-sized village, with a large tank, and ample fields and gardens; rich, dark soil; jungle all round. A camp of Brinjarries was here with 300 bullocks carrying rice; they have come from Raipur and are on their way to Párvatipúram (which they say it will take them a month to reach); thence they go to Nowpaula for salt; good camping ground; supplies available.

*Drinking water* from tank and river, no wells. A vaccinator (a Mussulman) has lately arrived here from Raipur. He has experienced some difficulty in procuring supplies, as he had orders, so he said, to obtain all he wanted without payment.

Height of Torbor above mean sea level 949 feet; rise from Kúmúna 92 feet.

Distance from Vizagapatam 278 miles, 3 furlongs; from Raipur about 93 miles.

14th December.—*Torbor to Staljóri*. Thermometer  $\left\{ \begin{array}{l} 6 \text{ A.M., } 52^{\circ}. \\ 11 \text{ A.M., } 82^{\circ}. \\ 4 \text{ P.M., } 80^{\circ}. \end{array} \right.$

Exposed to the sun at noon,  $115^{\circ}$ .

Distance 11 miles, 5 furlongs, 175 yards.

1 mile, 1 furlong.—*Stream*, 26 feet  $\times$  6 feet; low banks, sandy bed, no rock. Tree and scrub jungle with a few fields here and there, soil hard and gravelly; then some heavy and dense jungle.

A track 20 to 30 yards wide has been cleared through the densest parts of the jungle, and leads evenly over hard and high ground without much change of gradient.—Another small *stream*, 12 feet  $\times$  3 feet; low banks, gravelly bed; some rice-fields about.

The railway should be kept on the lower ground to the west; jungle light; soil, dry and hard.

Two small *streams* close together, each 6 feet  $\times$  3 feet.

4 miles, 183 yards, a *stream*, 50 feet  $\times$  10 feet; crossed below the junction with a smaller stream; one bank high, the other low; bed sandy; some rock for foundations.—Some *sál* trees about here; much *quartz*. Light scrub jungle with a few patches of cultivation.

Small *nullah*, 6 feet  $\times$  3 feet. 5 miles, 2 furlongs, a large pool in the fields, near a small village, Daldalli.

Some cotton grown here and a good deal of rice; high ground; dark soil.

6 miles. *Nuapára*, in a large clearing; high ground; dark soil; wet and dry fields. Thin scrub jungle.

*Village of Kandamuri*.—The custom of the villagers in these parts is to bring tobacco to approaching strangers (everybody smokes here), sometimes they bring buttermilk besides.

8 miles, 4 furlongs, 113 yards. *Sámbarsingi*.—From here leads a track to Tarnot (Khóla). There are three *tombs* here on the roadside, where the headmen of the village are buried; the graves are marked by heaps of stones. The common people are buried in the jungles, or else burnt. *Iron* is manufactured at Sámbarsingi. The place was probably named after the sambur which seem to be plentiful here, to judge from the traces they leave. Open country, then light jungle. A small *stream*, 10 feet  $\times$  4 feet.

9 miles, 6 furlongs. *Kajurbara*.—Undulating ground; the line of rail should keep a mile further to the east; soil, dark rich clay.

A fine hill ridge, the Ganda-Mardan hills, 3,000 feet high, 6 to 8 miles long with a plateau on top, a mile broad, larger than Kámandroog, lies 15 to 20 miles to the east.

Two small *streams*, close together, each 12 feet  $\times$  4 feet; no rock.

There is some *game* in these jungles and in the low hills to the west. The traces of bear, sambur and bison are frequently seen. A small cheetah was brought in that had been killed in a fight with a larger one near the village, where both were hovering about the cattle.

11 miles, 6 furlongs. *Staljóri*.—The line of rail should run about a mile to the east of this.

Height of Staljóri above mean sea level 1,047 feet; rise from Torbor 98 feet.

Distance from Vizagapatam 290 miles; from Raipur about 82 miles.

15th December.—*Staljóri to Birumál*, on the line to Onki. Thermometer  $\left\{ \begin{array}{l} 6 \text{ A.M., } 50^{\circ}. \\ 11 \text{ A.M., } 78^{\circ}. \\ 4 \text{ P.M., } 80^{\circ}. \end{array} \right.$

Exposed to the sun at 4 P.M.,  $86^{\circ}$ .

Distance 10 miles, 7 furlongs.

In the first mile a small *nullah* 8 feet  $\times$  3 feet; some thin jungle, then open country.

1 mile, 4 furlongs. *Paraskol*.—A good-sized village which seems to have moved a mile eastwards since the map was made. Villages here sometimes shift their site.—Some Brinjarries belonging to these parts were buying gingelly seed in order to take it to Párvatipúram via Junágar and the Músa ghât. High ground, hard soil; jungle.

The railway should be  $1\frac{1}{2}$  miles to the east of the straight line from Staljóri to Jalbal; the ground to the east is not so high, and more even; but the jungle is very dense. Many traces of sambur and some of bison; soil hard; a long stretch of trackless jungle; near Jalbal it becomes lighter. *Stream* 10 feet  $\times$  5 feet; no rock visible.

Emerging from the jungle we come upon the village of *Jalbal*, 5 miles, 2 furlongs. Here the rail to Raipur will turn north-westwards to Nara; but we now continue our northerly march towards Onki to explore the ground in case the rail should be taken there. Open

ground round Jalbal, some wet and dry fields; in the gardens are chillies, beans, pumpkins, hybiscus, castor oil and tobacco. South of the village the soil is chiefly light, to the north mostly heavy and black. The higher ground is generally of light soil, the lower parts are swampy; but the undulation of the ground is very slight.

A small *tank*, breached; a *stream* 9 feet  $\times$  3 feet used for irrigation comes through the breach, muddy bed and banks.

*Gúchapali*, the site of the deserted village; the inhabitants are said to have left 20 years ago on account of cholera; there is no trace of the village left, except the fields, which are still partly cultivated.

*Kóduméra*, a mile to the left; light soil, open country, good camping ground.

Small *nullah*, 12 feet  $\times$  5 feet.

*D ripali*, small village; some iron furnaces here; the ore worked is of two kinds, hæmatite and bog ore. Here is also a *weaver's* loom. Country somewhat open. Sál trees are found in the surrounding jungle. Light soil, brown clay with sand. Then dense jungle of shrubs and small trees. Level ground.

10 miles 7 furlongs. *Birumál* in a jungle clearing, a mile in diameter; soil hard; good camping ground, except that the only drinking water available, *viz.*, from the tank or dammed-up-stream, is inferior; but wells could easily be dug in the fields, the water being not far below the surface. There are no wells in these villages. The line of rail should be half a mile to the east of this, where the ground is more even.

Height of *Birumál* above mean sea level 1,013 feet; fall from *Síaljóri* 34 feet.

Distance of *Birumál* from *Vizagapatam* 301 miles.

16th December.—*Birumál to Amúndi*. Thermometer  $\left\{ \begin{array}{l} 6 \text{ A.M. } 47^{\circ}. \\ 11 \text{ A.M. } 80^{\circ}. \\ 4 \text{ P.M. } 77^{\circ}. \end{array} \right.$

Exposed to the sun at 3 P.M.  $102^{\circ}$ .

Distance from *Birumál* to *Amúndi* 12 miles 3 furlongs.

Height of *Amúndi* above mean sea level 918 feet; fall from *Birumál* 95 feet.

Distance from *Vizagapatam* 313 miles 3 furlongs.

In the first mile a *nullah*, 15 feet  $\times$  5 feet, dammed up in several places so as to make it spread over the adjoining fields on both banks which are cultivated with rice; hence the ground on both sides is very swampy and difficult to get across, even at this season when the rice crops have been harvested; then jungle.

*Pára*, a *Brinjarri* village which has been here for the last three years only; the people of *Gyran* would not allow the *Brinjarries* to live in their village from fear that cholera might be introduced by that wandering tribe, so the *Brinjarries* had to build a village of their own.

1 mile, 4 furlongs, 192 yards. *Gyran*.—A largish village in the midst of an extensive jungle clearing; further on the jungle is light; soil, dark, stiff clay.

2 miles, 4 furlongs. *Séndebutla*.—A new village, only six years old, not marked on the map; rich, dark soil; there are some weavers here; then jungle again, not very dense; ground gently undulating. Large clearings alternating with stretches of jungle; soil, lighter on rising ground, and heavier in the hollows which are mostly swampy.

3 miles, 4 furlongs. *Barankéla*.—Black soil; extensive rice-fields. Small *nullah* 10 feet  $\times$  4 feet, converted into wet fields; then some undulating ground with light jungle.

*Stream* 20 feet  $\times$  5 feet used for irrigation, muddy bed and banks.

5 miles, 6 furlongs. *Village of Bisora*.—Another *stream* dammed up in several places in the manner in vogue here, and converted into swamps for rice cultivation. Then jungle of trees and scrub, on light sandy soil; the jungle soon becomes dense and contains numerous sál trees; after a mile of this the bush becomes thinner again. The soil continues chiefly light (with black patches here and there) and the ground slightly undulating till past the 8th mile. At the beginning of the 9th mile a small muddy *stream*, 10 feet  $\times$  4 feet, used for irrigation.

9 miles, 210 yards. *Village of Beltikri*.—Open country around, the jungle clearing measuring about a mile in diameter. A mile beyond *Beltikri*, a *nullah* 20 feet  $\times$  8 feet, with swampy bed and steep banks.

11th mile. *Balésar*, an ordinary small village with gardens and fields; then sál jungle.

12 miles, 3 furlongs. *Amúndi*, surrounded by jungle containing numerous sál trees, which abound in this part.

Country open; good camping ground; drinking water from the *Jong* river. Supplies available; soil, dark clay; quartz and kunkur limestone found along the whole route; gneiss continues to be the prevailing rock formation.

Iron ore (hæmatite) is smelted at *Amúndi*. The villagers have a number of crude carts with solid wooden wheels, drawn by black buffaloes; cattle numerous.

The greater part of the country traversed from *Karial* up to this (mostly jungle, and much of it virgin soil) would, I believe, produce good wheat crops with very little cultivation.

No difficulties exist with regard to the railway, the country being practically flat, well watered and wooded, though sparsely peopled.

17th December, *Amúndi to Onki and back to Amúndi*. Thermometer  $\left\{ \begin{array}{l} 6 \text{ A.M. } 43\frac{1}{2}^{\circ}. \\ 12-30 \text{ P.M. } 86\frac{1}{2}^{\circ}. \\ 4 \text{ P.M. } 78\frac{1}{2}^{\circ}. \end{array} \right.$

Distance 6 miles, 7 furlongs.



Height of Onki above mean sea level 899 feet. *Fall from Amúndi 19 feet.* Explored both banks of the *Jong river*; crossed over to *Cheruda* on the left bank, thence went to *Nilasar*. (The "*Cheruda*" marked on the map on the right bank, a mile north of *Amúndi*, does not exist, and the people say there never was such a place on the right bank.) Fine jungle; soil black, full of cracks, fissures and holes; then scrub jungle and high grass. Some people have come here all the way from *Rájim* to cut grass and take it away for thatching, &c. The grass is very long and strong, and is used for making mats, fences, verandah screens, and for thatching roofs.

*Nilasar* is a small collection of mud hovels in the midst of *sál* jungle; thence I went to *Belanger* on the right side of the river; jungle of scrub and grass; soil, dark and rich; a kind of *hemp* is grown here, called "*son*" in Hindi and *janam nara* in Telugu.

The nullah near *Belanger* is 50 feet wide and 15 feet deep; one bank is 15 feet high, the other low and subject to inundation during floods. There is rock for foundations. A stretch of coarse grass jungle; the grass 10 feet high, and upwards; then some *sál* jungle, and irregular ground. A small nullah 6 feet  $\times$  3 feet; light soil, hard and stony.

Two small streams each 15 feet  $\times$  5 feet, beds and banks muddy; then good tree jungle with *ippa*, *sál* and *matti*; ground flat again, soil light.

Marched over some very holy ground; black soil with wide and deep cracks and fissures, and deep holes where the ground has subsided from the rain. These holes occur every few yards, and, covered with grass as they are, it is difficult to avoid putting one's foot into a hole. It is impossible to ride over this ground.

6 miles 7 furlongs. *Onki*.—A small collection of miserable hovels in a howling wilderness, jungle all round; soil, stiff dark clay. The people of the village at sight of us ran away, but returned again by-and-by.—Returned to *Amúndi* on the right bank *viá Belanger* and *Parsoda* (the latter two miles north of *Amúndi*); crossed two small streams, 20 feet  $\times$  5 feet each, dammed up and converted into swamps for rice cultivation; and a larger stream 45 feet  $\times$  8 feet, a mile north of *Amúndi*, with high banks, sandy bed, and no rock.

Reached *Amúndi* at 12-30 P.M., having travelled 14 miles 3 furlongs since 6 A.M., taking observations, making notes, &c.; the temperature during this time having varied between 43° and 90°.

Straw about here is plentiful and cheap; it is left in the rice-fields to rot and manure the ground; only the ears of the paddy, with a short length of straw, being cut out in harvesting.

There is a remarkable scarcity of *mosquitos* in these jungles. I have only seen one small *snake* since leaving *Párvatipúram*, and met no *scorpions* or *centipedes*; *white-ants* are not plentiful. I have seen no *hares* nor *rabbits*, no wild *pig* nor *deer*, except a tame one in a village; very few *jungle fowl*, no *pea fowl*, no *bustard*; *pigeons* are numerous; *partridge*, *quail* and *snipe* scarce. There are *ducks*, and other water fowl on some of the tanks; also *cranes*, *storks*, *plovers*, and *white gulls* and *paddy birds*; some *Java sparrows*, *minas*, *parroquets*, a few *swallows*; *crows* are scarce in the small villages in the jungles; *jackals* everywhere plentiful. *Gum*, *dyes* and *resin* (*sál*) are to be obtained from several jungle trees.

There is a pretty *orchid* growing on some young *ippa* trees, with a red flower like *honey-suckle*.

Distance of *Onki* from *Vizagapatam* 320 miles 2 furlongs.

„ from *Raipur* about 70 miles.

„ from *Sumbulpoor* about 100 miles.

18th December, returned from *Amúndi* to *Birumál*, distance 12½ miles. Thermometer  $\left\{ \begin{array}{l} 6 \text{ A.M. } 43\frac{1}{2}^{\circ} \\ 11 \text{ A.M. } 74^{\circ} \\ 4 \text{ P.M. } 78^{\circ} \end{array} \right.$

The sick whom I had left behind in the camp at *Birumál* had improved during their two days' halt there.

19th December, returned from *Birumál* to *Jalbal*, thence to *Nara*.

Distance travelled 14 miles 6 furlongs, viz., *Birumál* to *Jalbal* 5 miles, 6 furlongs.

*Jalbal* to *Nara* 9 miles. Thermometer  $\left\{ \begin{array}{l} 16 \text{ A.M. } 40^{\circ} \\ 11-30 \text{ A.M. } 91^{\circ} \\ 4 \text{ P.M. } 80^{\circ} \end{array} \right.$

There was some *hoar frost* on the ground in the morning, between *Birumál* and *Jalbal*.

Resumed march to *Nara*, where we left off on the 15th. After leaving *Jalbal*, some light jungle was passed through, on light clayey soil.

1 mile, 2 furlongs, 94 yards.—Village of *Salia*; country rather open, very little jungle about.

Wet and dry fields, and garden cultivation; some laterite was seen cropping out.

2 miles 1 furlong, 108 yards. *Chanabeda*.—A tank, gardens and fields. Plantains in the gardens, the first seen since *Bisemkattak*. Country open, trees and shrubs about.

2 miles, 6 furlongs, 71 yards. Stream 35 feet  $\times$  10 feet, sandy bed, banks low and flooded. Then a swamp at this season dry, except in the lowest part.

3 miles, 2 furlongs, another swamp,—with a stream running through it about 30 feet  $\times$  8 feet; the bed is muddy and irregular and has several branches; swamp extends close up to *Amseri*.

3 miles, 4 furlongs, 149 yards, village of *Amseri* on high ground, with a tank and wet and dry fields. Near the village is a small hillock through which a *quartz reef* runs. Then

light jungle with some swampy patches. Then high ground with light jungle on hard soil, followed by a gentle descent, with another stretch of swamp partly cultivated.

5 miles, 4 furlongs, 109 yards. *Kopathora*.—Gardens and fields; tame pigeons are kept in many of these villages, and on the trees are found large blue, green and grey pigeons in a wild state.

No bustard seen, very few partridges, scarcely any snipe.

6 miles, 6 furlongs. *Mograpali*.—With a tank and the usual cultivation. Met a large herd of Brinjarri bullocks carrying wheat to Párvatipúram.

Village of *Kurumura*, small, not marked on the map.

8 miles, 2 furlongs, the *Jong stream*, 600 feet wide, depth in flood 16 feet; irregular, sandy bed with small islands, low banks subject to floods, no rock visible. This river is the boundary of the Karial estate.

9th mile. *Nara*.—Large village, the head-quarters of a zemindar who owns twelve villages. The old zemindar is 84 years of age and infirm; his sons and his dewan came to the camp and attended to our wants; guides, coolies and supplies were promptly furnished. There is a good encamping ground at Nara, good water to be had from tanks and the river; there are also some wells in the gardens.

In the village are weavers and iron smelters, no carpenters.

The Police Officers of the Karial Rajah, who had accompanied the camp up to this and been very useful, returned from here.

Height of Nara above mean sea level 1,010 feet; fall from Birumál 3 feet, from Sialjóri 31 feet.

Distance of Nara from Vizagapatam 304 miles 3 furlongs; from Raipur about 62 miles.

20th December.—*Nara to Bagbahra*.—Distance 10 miles,  $\left\{ \begin{array}{l} 6 \text{ A.M. } 41\frac{1}{2}^{\circ} \\ 11 \text{ A.M. } 80^{\circ} \\ 4 \text{ P.M. } 80^{\circ} \end{array} \right.$   
5 furlongs. Thermometer

Passed through some paddy fields and uncultivated swamps, crossed two small streamlets requiring culverts, then a fine tank near the village of *Bendravan*, 1 mile, 4 furlongs. No jungle here, all cultivation, both wet and dry.

2 miles, 4 furlongs, village of *Ukra*; much wet cultivation. Then thin scrub jungle.

A small village, named Lámi; jungle again, with a few isolated patches of fields.

4 miles, 1 furlong, 153 yards. *Kandajori stream* 250 feet wide, 16 feet deep, sandy bed with some rock; banks low, and flooded in the rains. The rock is gneiss, with quartz and felspar in veins and patches.

The railway need not cross this nullah if the *Jong river* is bridged a mile below Nara.

4 miles, 5 furlongs, 155 yards. *Kumakan*.—A large village; the zemindar of Súarmal lives here, who owns 80 villages. This village has two tanks and a large swampy place in a shed; a new building is being constructed of stone; beyond the village, a nullah 20 feet  $\times$  4 feet.

3 miles, 7 furlongs, 94 yards. *Kulia*.—With extensive fields; black soil; then some high ground with thin jungle on light soil. A tank; jungle again; small nullah 6 feet  $\times$  3 feet.

8 miles, 2 furlongs. *Páluari*.—A few huts in a small jungle clearing; soil, dark clay with sand.

8 miles, 7 furlongs, 153 yards. *Kopli*.—A large village where a new tank is being constructed by the zemindar of Súarmal, Umra Sing, who met me outside the village with his two little sons and a large following, and accompanied me to *Bagbahra*. He was most attentive to the wants of the party and asked that the Government might be informed of this fact. He seemed very energetic and intelligent, and was pleased with the prospect of a railway through these parts.

A letter from the Commissioner of Raipur, dated the 9th November, and addressed to me at Bondesor, was brought to me only to-day by a Policeman from Bondesor who had walked 120 miles in four days.

Height of Bagbahra above mean sea level 1,083 feet; rise from Nara 73 feet.

Distance of Bagbahra from Vizagapatam 315 miles; from Raipur about 55 miles.

21st December.—*Bagbahra to Telebanda*. Distance 12  $\left\{ \begin{array}{l} 6 \text{ A.M. } 52^{\circ} \\ 11 \text{ A.M. } 87^{\circ} \\ 4 \text{ P.M. } 89^{\circ} \end{array} \right.$   
miles, 6 furlongs, 204 yards. Thermometer

Some rice fields in the lower grounds; then jungle; a small streamlet with rocky bed; irregular ground, slightly hilly; jungle of brushwood and trees for nearly 4 miles on varying soil, mostly rich dark clay. In the jungle (3rd mile) *Pendri*, the site of a deserted village which the people are said to have left on account of want of good water; dense jungle. At the end of the 3rd mile a nullah 25 feet  $\times$  5 feet, sandy bed, low banks, no rock. Further on, two small nullahs 10 feet  $\times$  4 feet each; a third 8 feet  $\times$  3 feet; undulating ground.

5 miles, 5 furlongs, 79 yards.—*Putrapali*, with fine garden cultivation, and wells; maize, hemp, onions, garlic, spinage, beans, pumpkins, chillies, brinjals, plantains, castor-oil, mustard, sugarcane, tobacco, &c., are grown here. Met 200 Brinjarries' bullocks carrying gingelly seed and wheat to Párvatipúram.

6 miles, 5 furlongs, 203 yards. A shallow nullah 100 feet  $\times$  6 feet, low banks, sandy bed; all jungle again. Another nullah close to the former, 50 feet  $\times$  4 feet, with low banks and sandy bed. Some paddy swamps; then the village of *Kasibara* at 7 miles, 5 furlongs, wet and dry fields, and gardens with wells; jungle again; a small nullah 8 feet  $\times$  3 feet.



9 miles, 3 furlongs. A stream 30 feet  $\times$  5 feet with sandy bed and low banks, near the site of *Aorababri*, a deserted village. Black soil, full of cracks, fissures and holes; scrub jungle with swamps, uncultivated. Two small swampy streamlets 5 feet  $\times$  2 feet. More swampy ground; then another. *Kasibara*, a large village at the end of the 12th mile; gardens with wells and extensive fields. The water in the wells is 6 to 10 feet below the surface; *laterite* is found here.

A Superintendent of Vaccination from Raipur and a vaccinator were in the village.

12 miles, 6 furlongs, 204 yards. *Telibanda*, small village. A Head Constable from *Karti*, which has a Police station and Post office, came here to assist the camp. A Munshi, sent on the 12th November by the Deputy Commissioner of Raipur to meet the party at *Karial*, turned up here only to-day (having been to *Karial* and missed me) and made himself useful in procuring supplies, &c.

Height of *Telibanda* above mean sea level 1,022 feet; fall from *Bagbahra* 61 feet.

Distance of *Telibanda* from *Vizagapatam* 327 miles, 7 furlongs, 117 yards; from *Raipur* about 46 miles.

December 22nd.—*Telibanda to Mahasamund*.—Distance 11 miles, 6 furlongs, 124 yards. Thermometer, 6 A.M., 47°; 11 A.M., 80°; 4 P.M., 80°.

Passed over extensive rice fields, now nearly dry, the crop having been gathered. Then jungle on slightly undulating ground.

2 miles, 6 furlongs. *Mámubancha*, a large village with much cultivation around.

Then an uncultivated swamp, with a small stream, 10 feet by 4 feet, running through the deepest part; muddy bed and banks.

3 miles, 7 furlongs.—The site of *Pathripali* village, now deserted; no sign of former cultivation; jungle all around. The people are said to have been engaged in illicit dealings with timber and spirits, hence they were driven from the village. All jungle. Some *laterite* is seen cropping out.

4 miles, 170 yards. *Sikli nullah*, 25 feet by 8 feet; sandy bed, good banks, no rock. Then some clearing with cultivation. Soil black, full of holes. Small *nullah*, 6 feet by 3 feet.

5 miles, 190 yards. *Arand*, a considerable village, with fields and gardens. Wells in the latter; water about 10 feet below the surface, and said to be good.

6 miles, 3 furlongs. *Umarda*, a small village with a tank.

7 miles, 1 furlong.—A stream 15 feet by 6 feet, with *laterite* rock for foundations. Light clayey soil; jungle.

7 miles, 6 furlongs, 120 yards.—Stream 10 feet by 4 feet; *laterite*, gravel in the bed. Jungle on both sides. Then a swamp; beyond that two small villages, *Murmár* and *Kamári*. Then two small nullahs, 9 feet by 3 feet.

There is much *laterite* about here; the prevailing rock formation is still gneissic, which ceases at the *Mahanadi*.

9 miles, 1 furlong.—The village of *Pathripali*, where a blacksmith is at work with rude implements and contrivances.

A small stream, 4 feet by 3 feet, then a larger one 12 feet by 4 feet.

10 miles, 3 furlongs, 182 yards.—*Pitiajer*, small village.

11 miles, 6 furlongs, 124 yards.—*Mahásamund*, a large place, said to contain 400 houses and over 1,000 inhabitants. Carpenters and blacksmiths here. A survey station and a temple are prominent objects. The soil consists chiefly of *laterite*; water is good. Encamping ground high and extensive. A tank; topes and trees about. Here is the beginning of a cart-road marked out by side drains, leading to *Arang*; and here also the track from *Tarnot* (*via Tendubara*, the *Sirgidi Ghat*, *Kamaria* and *Karti*) joins our line.

Height of *Mahásamund* above mean sea level, 915 feet; fall from *Telibanda* 107 feet.

Distance of *Mahásamund* from *Vizagapatam* 339 miles, 6 furlongs; from *Raipur* 34 miles.

December 23rd. *Mahasamund to Arang*.—Distance 10 miles, 2 furlongs. Thermometer, 6 A.M., 44°; 11 A.M., 79°; 4 P.M. 75°.

Marched along a cart track, partly lined out and roughly made. All fields; no jungle.

1 mile, 3 furlongs. *Kharóra*, a large village with much wet cultivation; good topes; a tank.

3 miles, 5 furlongs. *Belsóra*, a large village like the former. Country level and open, well cultivated; no jungle.

At the sixth mile, near the bank of the *Mahanadi*, the village of *Gorari*. Here is some solid *kunkur* rock; also stratified limestone rock, similar to that at *Cuddapah* and *Kurnool*.

Then cross the *Mahanadi River*, 2,040 feet wide and 25 feet deep during great floods which spread close up to the village of *Gorari*, covering the ordinary banks near the river's edge to a depth of 10 feet.

The ordinary floods, contained between the banks, and not overflowing them, run about 15 feet deep.

The bridge will require to be 30 feet to 35 feet above the deep bed. The low water at present is 260 feet wide and little more than 2 feet in depth. The bed is sandy; on the eastern bank and in the bed is limestone rock; on the west bank none is visible, but it will probably be found not far below the bed.

A quarter of a mile from the west bank is an irrigation canal taken off from the river.

7 miles, 6 furlongs. *Paragáon*, with a suburb occupied by potters. Soil, clay and *laterite*; mostly cultivated; little waste land; no jungle.

Here we join the main road from Raipúr to Sumbulpoor; a new road is being made to Gorári.

*Ninth mile, a nullah*, 20 feet by 6 feet; high banks, stony bed (limestone).

*10 miles 2 furlongs. Arang.*—Good encamping ground.

Fine tope, good water from wells and tanks. Post office, police station and school here; also a travellers' bungalow, a dispensary, and a fine temple.

Distance of Arang from Vizagapatam 350 miles; from Raipúr 23 miles.

Height of Arang above mean sea level 942 feet; rise from Mahásamund 27 feet.

*December 29th. Arang to Hasaud.*—Distance 13 miles 4 furlongs. Thermometer 6 A.M., 55°; 11 A.M., 75°; 4 P.M., 78°.

*First mile, village of Bihari.*—Open, flat country, well cultivated; black soil.

*2 miles 6 furlongs. Rasni*, an ordinary village, with tope and tanks; sugarcane and rice-fields.

*5 miles 2 furlongs. Tappal hut.*—The ground here is gently undulating; soil laterite; the whole of the country, so far as the eye can reach, is cultivated; little waste land; no jungle; firewood is scarce; no hills.

Trees are few and far between, but each village has one or more topes and tanks; some have wells.

*7 miles 2 furlongs. Kulhán stream*, 50 feet wide and 10 feet deep in flood; high perpendicular banks; bed gravelly, no rock visible.

*10 miles 2 furlongs. Náogáon*, a small village, with a police station, temple, tope and tank; soil in some parts red, in others black; ample fields, dry and wet. Here I met the first wheat fields along this route; there were none east of this.

*13 miles 4 furlongs. Hasaud*, a large village, with tanks, topes, wells and extensive cultivation. Soil, light brown clay. Good encamping ground.

Distance of Hasaud from Vizagapatam 363 miles 4 furlongs; from Raipúr (east end) 8½ miles.

Height of Hasaud above mean sea level 969 feet; rise from Arang 27 feet.

*December 30th. Hasaud to Raipúr.*—The country is flat and well cultivated, with both wet and dry crops.

*2 miles, 1 furlong. Sirikheri*, village with tope and tank.

*3 miles 5 furlongs, 185 yards. Jora*, similar to the last, with much wet cultivation; black soil.

*5 miles. Labhandih*, similar to the last two villages; black soil. A stream 40 feet by 8 feet, with high banks, and limestone rock in the bed.

Half a mile further a smaller stream, 15 feet by 6 feet; banks and bed of black soil.

Much wheat and linseed are grown about here.

*6 miles 6 furlongs 130 yards. Village of Telibanda or Kurwatoli*; with a fine tank, and tope of mhowa trees.

*8 miles 1 furlong 80 yards. East end of Raipúr Cantonment*, near the Deputy Commissioner's Court.

The distance of Raipúr from Vizagapatam by the route marched over is 371 miles 5 furlongs 211 yards.

Altitude of Raipúr above mean sea level 962 feet.—I went at once to see the Chief Commissioner of the Central Provinces, Mr. Morris, B.C.S., who was here on tour; and the Commissioner of the Chattisgarh Division, Colonel Lucie-Smith; both officers are going into camp to-morrow, en route to Beláspur.

RAIPÚR,  
6th January 1882.

K. F. NORDMANN,  
Executive Engineer, on Special Duty.

## XII.

No. 27R, dated Raipúr, 14th January 1882.

From—K. F. NORDMANN, Esq., Executive Engineer, on Special Duty,

To—The Secretary to Government of Madras, Public Works Department.

In continuation of my letter No. 24R., dated 6th instant, I have the honor to inform you that I have this day posted to your address a tin case, containing the longitudinal section of the country traversed by the reconnoitring party, from Párvatipuram to Raipúr, and the cross sections of all streams exceeding 30 feet in width.

2. I have despatched one camp this day, and leave Raipúr to-morrow for Rájim, whence I march up the valley of the Pairi, and then up the Sondor river passing Noagarh, then up to Raigarh, Omorkót, Nárangpur and Kuraputi.

3. Mr. Cormac follows *viâ* Dhamtari, Kankér and Banskót to Omorkót, where we expect to meet about the 1st of February; reaching Kuraputi about the 14th idem.

4. From all the information I have been able to collect, I see no necessity for examining a line leading from Dhamtari up the valley of the Silári to



Sihóá and Borái, which was travelled over and reported on, in 1876, by Colonel Francis, then Executive Engineer at Raipur. This line goes over some very high, rough and uneven ground, and seems in every respect inferior, for the purpose of a Railway, to either the line up the Sondor river, passing near Noagarh, or the line *viâ* Dhamtari, Kankér and Banskót.

5. I beg that letters may be addressed to "*Narangpur viâ Kuraputi, to await arrival.*"

### XIII.

No. 38 K., dated Kuraputi, 25th February 1882.

From—K. F. NORDMANN, Esq., Executive Engineer, on Special Duty,

To—The Secretary to Government of Madras, Public Works Department.

In continuation of my letter No. 27 R., dated Raipur, the 14th ultimo, I

\*A. Executive Engineer's Notes of Reconnaissance from Raipur *viâ* Rajim up the Sondor River to Narangpur.

B. Do. do. from Narangpur to Kuraputi *viâ* the Madeoputi Ghât.

C. Mr. Cormac's Diary from Raipur *viâ* Dhamtari and Kankér to Omorkót.

D. Do. do. from Pupogón to Kuraputi *viâ* Jeypur.

E. Do. do. Report No. I-O, dated 1st February 1882.

F. Reports by Colonel Francis on routes from Raipur *viâ* Dhamtari and Sihóá towards Raigarh.

have the honor to submit\* herewith my Notes of Reconnaissance of the country between Raipur and Kuraputi *viâ* Rajim, Kópra, Bourka, Noagarh, up the Pairi and Sondor rivers, then *viâ* Háthgaon, Raigarh, Omorkót and Narangpur to Kuraputi, a total distance, by the straightest and easiest route, of 217½ miles.

2. I left Raipur on the 15th ultimo and marched through a well-cultivated country *viâ* Khandwa to Rajim, where I crossed the Mahánadi river, which is there 1,900 feet wide between the banks and 20 feet deep when in flood. From Rajim I marched up the right bank of the Pairi river. The ground traversed is on the whole very favourable for the construction of a Railway. The country is fully cultivated as far as Kópra and some miles beyond, and the gradients are generally light.

3. Near Bourka there will be some hill-side cutting required, for upwards of a mile along the steep and stony banks of the Pairi river. This part of the work, although insignificant in itself, may be reckoned among the heaviest that will have to be done on this line, which is a remarkably easy one throughout.

4. Near Karti I crossed the Pairi river, here 1,530 feet wide and 18 feet deep, and then passed over some high ground, culminating at the head of the Urtúli Ghât to Noagarh. The Urtúli Ghât is a steep ascent of about 120 feet, over which the present track passes, but which would be circumvented by a regular road or a Railway line. Thence I marched up the right bank of the Sondor river *viâ* Baltema and Tumaribahal to Karkú, and, crossing the Bag river, to Risgaon, Gourgaon, and Háthgaon.

5. There is no need for taking the road over the Urtúli Ghât to Noagarh, which is a very small place, although the head-quarters of a zemindar; as the line can be taken entirely up the right bank of the Sondor river from Karti *viâ* Benkura and Karka to Baltema. At Risgaon I fell in with the Brinjarri traffic from Jeypur and Kuraputi; the trade route leading from Raigarh *viâ* Háthgaon, Gourgaon and Risgaon to Sihóá, and thence to Dhamtari.

6. The sections, which will be submitted in a few days, show that the ascent up to Háthgaon (1,870 feet above mean sea level) is a very gradual one. From Háthgaon begins the final ascent on to the Jeypur plateau. There is a total height of 220 feet to be overcome, which, distributed over 5 miles, gives a gradual rise of 44 feet per mile, or 1 in 120. This route is quite practicable for a railway throughout, no regular ghât or steeper gradient than 1 in 100 being required; while the line passes through many miles of magnificent forest on virgin soil in a country full of promise, containing all the elements of future prosperity, where hundreds of square miles of the most fertile ground are waiting for the plough.

7. The Goláriah nullah, a mile to the east of Háthgaon, offers the greatest facility for taking a road up to the Jeypur plateau by a light gradient. The work will be quite easy; the jungle is dense, but there is only a small amount of hill-side cutting or ghât work required, very little heavy embanking and bridging, and as little rock blasting.

8. The whole country passed through from Bourka to Háthgaon is covered with forest and jungle. Villages are few and far between, especially in the upper course of the Sondor river; but the soil being good and well drained, the agricultural capabilities of the country are unlimited, and only wait for development.

9. The highest elevation reached on the Jeypur plateau, near its edge, was 2,100 feet above mean sea level, at Koliapodor; the distance traversed from Raipúr to Omorkót 143 miles.

10. At Omorkót I met Mr. Cormac on the 31st January, who had marched from Raipúr through the rich grain country of Dhamtari *viâ* Dargahan to Kankér, then up the valley of the Hatkul river to Banskót in Bustar, thence *viâ* Paorbel, Gurjinga and Bakúda to Omorkót, total distance 150½ miles. This line is 13 miles longer than the route I traversed, *i.e.*, *viâ* Rájim and up the Pairi and Sondor rivers; but the former also proved easy, as shown by Mr. Cormac's report (hereto appended) and his sections (which will follow), except in that part of the Hatkul valley between Chiprail and Siduwan, where for 4 miles a regular ghât road will have to be constructed along the hill-side at an average gradient of 1 in 40. The highest level reached by Mr. Cormac near the edge of the plateau was 2,146 feet near Siduwan.

11. Having carefully compared the two lines above described, I am of opinion that for the Railway the shorter line up the Sondor river should be chosen, while the route marched over by Mr. Cormac should be laid out as a road, *i.e.*, from Dhamtari *viâ* Kankér to Raigarh; and other feeders should be constructed to connect Dhamtari, Kankér, and Sihóá with the line of rail.

12. From Raigarh *viâ* Omorkót and Nárangpur to Ránigar, at the foot of the Mádeoputi Ghât, a distance of 90 miles, the line leads through a rich and beautiful upland country with fertile soil, and fine forest and jungle, at an average elevation of 1,900 feet; the surface in most parts level, in others diversified by hillock and swamp; much of the latter cultivated with rice, the whole offering no obstacles but every facility for the construction of a line of rail.

13. Whether this line west of the Noagarh Hills or the eastern line *viâ* Ryaguddah and Ombadóla is chosen for the Railway, I would recommend a specially important feeder that should be made in either case, *viz.*, a road between Nárangpur and Ryaguddah, leading from the former place up the Indrávati river to Jagannathpur and Kurmeli, then up the valley of the Gola-gad river to Maribata and down the valley of the Ryaguddah river to Ryaguddah, a distance of 65 miles. This is an easy and natural line of ghât, and the summit level near Maribata is not more than 2,700 feet above the sea.

14. And whichever of the two lines is selected for the Railway, whether that east or west of the Noagarh hills, I consider that the other line should be made into a good cart road with bridges, &c., complete, to be passable at all seasons.

15. The following lines would seem to be foremost among those required to be constructed as Railway feeders, in case the line of rail is taken from Raipúr *viâ* Rájim, Kopra, Karti, Baltema and Háthgaon to Raigarh, Omorkót, &c.:—

- (1) Raipúr *viâ* Dhamtari and Dargahan to Kankér.
- (2) Kankér *viâ* Salabat, Siduwan, and Banskót to Raigarh.
- (3) Kankér to Jagdalpur in Bustar.
- (4) Kankér *viâ* Sihóá and Sankra to the nearest Railway Station, say Tumaribahal.
- (5) Sihóá *viâ* Borai to Banskót (on the Kankér-Raigarh line).
- (6) Sihóá to Dhamtari.
- (7) Dhamtari *viâ* Achota to Kopra or Panduka (to be continued to Chura and Nara).
- (8) Noagarh to the nearest Railway Station.
- (9) Jeypur to Malkangiri.
- (10) Jeypur to Jagdalpur.
- (11) Jagdalpur, Kotpad, Nárangpur.
- (12) From Omorkót westwards *viâ* Amrati and Bamini to the Baordbig river.



(13) Nárangpur, *viá* Jagannathpur, Kurmeli, and Maribata to Ryaguddah (*vide* paragraph 13 above).

16. In case the Railway is constructed east of the Noagarh hills, *i.e.*, *viá* Párvatipuram, Ombadóla, Bógor, Karial, Nara, &c., the lines of road chiefly required to be constructed as feeders would appear to be the following:—

- (1) Torbor, Tarnot, Tendubara, Kamaria, Karti, Mahásamund.
- (2) Sankra (on the road from Raipúr to Sumbulpoor) *viá* Onki to Nara.
- (3) Nara, Chura, Panduka, Dhamtari.
- (4) Karial to the teak forest on the Udet river.
- (5) Patna to Torbor.
- (6) Patna to Bógor.
- (7) Asurgor to Sónpoor on the Mahánadi *viá* Turla and Bamini.
- (8) Ryaguddah *viá* Singapore and the Músa Ghât to Bondesor, Dádpur and Bógor.
- (9) Bondesor *viá* Nandol, Daspur, and Manjhér to Karial.
- (10) Daspur to Déobhog, and up the valley of the Tél river.
- (11) Singapore to Ombadóla *viá* Lonjigar.
- (12) Báliguda *viá* Tumriband to Ombadóla.
- (13) Párvatipuram to Kurupám, Butelly, and Goonipur.
- (14) Godairy to Bisemkattak.
- (15) Ryaguddah to Nárangpur *viá* Loddah, Maribata, Kurmeli, and Jagannathpur (*vide* paragraph 13 above).

17. When the Madras Government in 1875 proposed to make a road from the head of the Potinghy Ghât through the Jeypurcountry *viá* Nárangpur, Omorkót and Raigarh to the Central Provinces, the then Executive Engineer, Colonel Francis, at Raipúr, placed himself in communication with me at Potinghy, and, under orders from the Nagpur Government, that officer explored the country within his charge with a view to finding the best line of road to connect Raipúr with our proposed road through the Jeypur country. I have obtained through the Executive Engineer at Raipúr a copy of Colonel Francis' report, which I beg to append to these papers. From this report it will be seen that the several routes explored by Colonel Francis are unsuitable, on account of the hilly nature of the country, for the purposes of a Railway; but one of the routes, *viz.*, that from Raipúr *viá* Dhamtari, Kukrel, Dokal, Gatásili, Burgudi, and Borái will do very well for an ordinary road to act as a feeder to the Railway.

18. From Pupogaon, 17 miles south of Nárangpur, I sent Mr. Cormac to Jeypur, and thence up to Kuraputi by the new road, to report on the lay of the country and take a section\* of the ghât leading up to Kuraputi; while I marched *viá* Cheptaamb and Ránigar up the old Mádeoputi Ghât, in which direction, *i.e.*, up the Kuradi nullah, the easiest line for a Railway to the Kuraputi plateau is to be found; the gradients on this line will not exceed 1 in 75. The Railway Station for Kuraputi would in this case be near a village called Dengagura, about  $2\frac{1}{2}$  miles east by north of Kuraputi, and 400 feet lower than the latter place. Kuraputi itself, being near the edge of the higher plateau, is not easily accessible for a Railway from below, except by means of steep gradients. From Dengagura the line would gradually ascend to Dumriput, and thence go on *viá* Chikapár towards Sálúr. This section of the road will form the subject of a separate report when the reconnaissance of that part of the country and of the ghât portion of the line has been completed. I leave Kuraputi in a few days to undertake this the last section of the reconnaissance.

19. As regards the general question of the location of the proposed line of Railway, *i.e.*, whether it should go east or west of the Noagarh hills, it seems too early to discuss the subject until the most difficult part of line now being explored, *viz.*, the ghât leading from the 3,000 feet plateau to Sálúr, has been carefully considered by the light of figures and otherwise. But I may, perhaps, even at this stage of the investigation, be permitted to make a few observations bearing on the question, and I therefore submit the following points for consideration:—

- (1) The economical importance of the country to be developed is probably equal on both sides of the Noagarh hills, except perhaps that, looking to the rich and fertile rice and wheat pro-

ducing country of Dhamtari, the balance would appear to incline in favour of the western line which taps that great grain country.

- (2) The development, likewise, of the natural resources of the Jeypur State in the direction of the western route may be considered a pressing necessity, and the Railway on this line would lead all through Madras territory to within 100 miles of Raipúr. Of the present grain and salt traffic, between Chattisgarh and the coast, the major portion passes undoubtedly along the western route, as cannot fail to be observed by any one who travels over both routes.
- (3) For military and political reasons the western line also may be thought the more important of the two, bearing in mind the desirability of bringing the Railway near Jeypur and Bustar, where there have been from time to time outbreaks of rebellion which may occur again in future.
- (4) The engineering difficulties on both lines are much the same, but the cost of the western line would be somewhat enhanced on account of the ghâts which have to be surmounted at an altitude of over 3,000 feet, while on the eastern line the greatest elevation reached is only 1,346 feet. The item of bridging would probably be more costly on the eastern than on the western line, the former crossing a greater number of formidable streams than the latter.
- (5) As regards length, the western line will be from 20 to 30 miles shorter than the eastern, the saving in distance varying between the two figures named according to the gradient that may be accepted for the ghât portion of this route. With a gradient of 1 in 57 the saving in distance would amount to about 24 miles. But the shorter line would not be on that account much less expensive than the longer one, since the 25 or 30 miles of ghât work would cause extra outlay on the shorter line and so nearly assimilate its cost to that of the longer one. The relative cost of the two lines would roughly stand about thus :—

		£
Cost of eastern line, 372 miles, at £5,000 per mile	.	1,860,000
Cost of western line	{ 320 miles, at £5,000 per mile	1,600,000
	{ 30 „ at £8,000 „	240,000
		1,840,000

- (6) Finally, if Vizagapatam is to be improved as a port, it will be very advantageous in many respects to be able to send indigenous coal to the port, and for this purpose a Railway from the Godâvari coal-fields to Vizagapatam would eventually have to be constructed. Now, if the Raipúr Railway at present under discussion is taken west of the Noagarh hills, it will answer for a certain distance the purposes of the coal traffic from Chanda to Vizagapatam, as well as the grain traffic from Raipúr to Vizagapatam. In fact, part of the line from the port of Vizagapatam to the coal-fields will virtually be made by taking the Raipúr Railway west of the Noagarh hills. This western line will therefore save so much future outlay on a separate Railway which would have to be constructed from the port to the coal-fields, and it will answer the combined purposes of the Chanda-Vizagapatam coal traffic and the Raipúr-Dhamtari-Vizagapatam grain traffic.

Taking the whole distance from Vizagapatam to Chanda to be 450 miles, then about one-third of this distance, *i.e.*, nearly 150 miles, would actually be made by taking the Raipúr Railway west of the Noagarh hills. And, possibly, we may not have to go as far as Chanda or Wuróra for coal, since there is every likelihood of coal being ere long discovered in the valley of the Koláb river



between Jeypur and Bustar, and in the Malkangiri Taluk of Jeypur. This will constitute a strong argument in favor of the Railway being brought near these parts.

20. Observations regarding natural resources, produce, labor, soil, climate, seasons, manufactures, trade, population, &c., along the routes explored have been recorded from time to time in my Notes of Reconnaissance, as directed in paragraph 12 of G. O., No. 2294 W., dated 16th September 1881; the following is a summary of the observations recorded under these heads:—

(1.) BUILDING MATERIALS PROCURABLE; MINERALS AND METALS FOUND.—Materials, such as timber, building stone, clay for bricks, sand, limestone, iron, &c., are equally available on both lines. The rock formation is chiefly gneissic, except west of the Mahánadi, where sandstone and limestone rock prevail. Nodular kunkur limestone and different iron ores abound along both routes, except that kunkur is scarce on the Jeypur plateau. Quartz veins and reefs were found in many places; also some rubies and garnets. Traces of lead, graphite, antimony, arsenic, copper, silver and gold were met in several localities indicated in the notes. The soil is more or less fertile throughout on both lines, and varies from black cotton to light sandy loam. I scarcely saw any very poor soil anywhere.

(2.) CHARACTER AND AMOUNT OF LABOR AVAILABLE.—Local labor will, on the whole, not be found sufficient for the work on the railway, especially in the more sparsely populated parts, where both skilled and unskilled labor must be imported from other parts. The unskilled labor available will, as a rule, be found of a superior description, quite equal to the best in the Madras Presidency.

(3.) RATES OF SKILLED AND UNSKILLED LABOR.—The rates for unskilled labor are at present low along both routes, averaging  $1\frac{1}{2}$  to 2 annas per man per diem, paid mostly in grain, not coin; but these rates will in time, with large works going on, and a great demand for labor, very likely increase to 3 or 4 annas per diem.

Skilled labor will have to be brought from a distance to most parts of the work. The indigenous skilled laborers available, such as carpenters, blacksmiths, iron smelters, masons, &c., are of inferior quality, and very scarce besides on both lines. The rates of wages for such (inferior) skilled labor as there is at present are naturally low, say 2 to 4 annas per diem, paid generally in grain. When skilled labor is hereafter brought to the works from other parts, the rates to be paid in coin will be rather in advance of those prevailing in the more settled parts of the southern country.

(4.) CAMPING GROUNDS, DRINKING WATER, &c.—The country may be said to be equally salubrious on both sides of the Noagarh Hills, and good camping grounds are to be found near most of the principal villages; while wholesome drinking water can generally be obtained from the numerous streams and rivulets encountered on both lines. But where the only water available is from swamps or tanks, as is the case in many places, it is of course of inferior quality, and, especially when beginning to dry up, undoubtedly dangerous if used for drinking purposes. Wells, however, could easily be dug along both routes, the water being almost everywhere found close to the surface.

The forests contain a fair number of wild animals and game, such as tigers, cheetas, bear, bison, buffalo, nilgai, pig, sambhur and deer. There are no elephants. Pea fowl, jungle fowl, partridge, &c., are met.

(5.) CLIMATE AND WORKING SEASONS.—The climate along the several routes naturally varies in some measure; the lines explored between Vizagapatam and Raipur passing through  $3\frac{1}{2}$  degrees of latitude, while the elevation varies from sea level up to 1,346 feet on one line and over 3,000 feet on the other. But, allowing for the change of temperature due to an elevation of 3,000 feet on the upper Jeypur plateau, the climate may be said to be much the same on the both lines; and on the whole it is a very favourable climate for carrying out large works during the greater part of the year.

The working seasons are also nearly alike on the rival lines, both being but lightly affected by the two monsoons; practically there is nothing to prevent work being carried on throughout the year, save for a month or so during the

first violent burst of the north-east monsoon and for some time afterwards, when the jungles are very unhealthy, say from the end of October to the beginning of December. The hot weather is rather favourable for ordinary outdoor labor here as elsewhere in Southern India. The indigenous labor available will not suffer from fever, dysentery, &c., to the same extent as imported labor would.

(6.) CULTIVATION AND MANUFACTURES; FORESTS.—Detailed notes on the prevailing cultivation, in different parts along the several routes explored, have been given in my reports submitted from time to time. About one-fifteenth of all the country marched through, south and east of the Mahánadi, may be said to be under cultivation; the rest is chiefly jungle and forest, with some pasturage and waste land, but there is not much of the last.

West of the Mahánadi, however, and for some distance eastwards from its right bank, between Gorári and Ahtôa, and in the whole of the Dhamtari Taluk the country is fully cultivated, and there is little or no jungle.

The finest forests on the eastern line were found between Bisemkattah and Asurgor, then along the Sunder or Under river in the Karial estate, and between Kúmúna and Telibanda; while there is an extensive teak forest 15 to 20 miles south-west of Karial.

On the western route I marched through some magnificent forests, along the course of the Sorul or Sonder River, from Karti up to Raigarh. There is fine and uninterrupted *forest* (not merely *jungle*) from Paraga to Noagarh, a distance of 16 miles, with not a village among the whole line.

From Noagarh to Nárangpur, and further south, is beautiful forest all the way, sometimes primeval forest, on rich virgin soil. Now and then the tall forest relieved by common jungle, or small clearings for cultivation, and divided by occasional belts of swampy ground, partly cultivated, through which the drainage of the country passes. The number of villages is small and the population sparse. Hundreds of square miles of the most fertile soil are waiting for the plough. This description of country continues up to the foot of the Mádeoputi Ghát leading to the upper Jeypur plateau (Kuraputi).

The useful timber trees chiefly found in the forests are sál and matti, but there are also blackwood, yégi and some other kinds. Teak is rather scarce in these jungles, except in special localities, such as the teak forest near Karial noted above. Of fruit and other useful trees, jack, fig, gooseberry, tumica, mango, tamarind, margosa, and variety of acacias are everywhere found. The mhowa or ippa tree abounds in all the country travelled through, north of Ryaguddah and west of Potinghy, but its wood is not useful for timber.

The sheep and cattle met with were on the whole not numerous, and of a very ordinary breed. Country ponies are to be had at Raipur, Rajim, and Sónpur, where cattle fairs are periodically held.

The crops, which are much the same east and west of the Noagarh hills, consist of several kinds of rice, sugarcane, ragi, two or three kinds of gram, millets, oilseeds, wheat (this last chiefly west of the Mahánadi), tobacco, chillies, mustard, garden vegetables, &c. The quantity of rice grown along both lines, sometimes by means of primitive and inexpensive methods of irrigation, and sometimes dependent upon a few seasonable showers of rain only, is very large, and shows what could be done in this direction by a more numerous and civilized agricultural population. Irrigation is carried on partly by small river and spring channels, or under rudely-constructed tanks; and partly along the sides of nullahs, when the banks are cut down, the ground levelled and small flat valleys created; as well as in swamps, which are to some extent drained and then converted into rice-fields.

The average price of rice at Raipur and Dhamtari in December and January was one rupee for 60 seers, and of wheat one rupee for 45 seers.

Several kinds of oil, coarse sugar, ghee, and alcoholic liquor distilled from the flower of the ippa or mhowa tree are largely manufactured.

Tassa silk and coarse cotton cloths are made at Risga near Tukla in the Karial estate, also near Dhamtari, and in some other places. The tassa silk-worm feeds upon the leaves of sál and matti trees.



Glass bangles and some rough lacquered ware are manufactured at Nárangpur.

Skilled workers in leather and iron, as well as gun-makers, brass-workers, goldsmiths and jewellers, are rare.

(7.) TRADE AND TRADE ROUTES.—The chief products carried from Chat-tisgarh, Jeypur, and Bustar to the coast are rice, wheat, gingelly-seed, linseed, Bengal-gram, horse-gram, turmeric, ginger, dammer, arrowroot, soapnuts, marknuts, myrabolams or gallnuts, hides, beeswax, honey, horns, hoofs, iron, and lac (the product of an insect). The chief imports carried from the coast to the interior are salt, saltfish, cloths, opium, spices, glass bangles, &c.

Trade is almost exclusively carried on by means of pack-bullocks belonging to the wandering tribes of the Brinjaries, and the chief routes frequented by them are the following :—

- I. From the several salt-pans on the coast to Sálúr and Párvatipúram.
- II. Párvatipúram *viá* Ryaguddah, Bissemkattah, and Ombadóla to Sant-púr, Dádpúr, and up to the Tél Nadi and Mahánadi to Sónpoor and Sumbulpoor.
- III. Párvatipúram *viá* Narrainputnum, Letchmipuram, Dasmatur, Gir-ligama to Nárangpur.
- IV. Ryaguddah *viá* Singapore and the Músa Ghât to Bondesor (Bhawá-nipatnam).
- V. Músa Ghât *viá* Junágar and Déobhog to Noagarh and Rájim.
- VI. Bondesor *viá* Daspúr, Manjhér, Karial, Torbor, Tarnot, Sirgidi, Karti to Arang and Raipur.
- VII. Sálúr, Kuraputi, Nárangpur, Omórkot to Kánkér and Dhamtari.
- VIII. Omórkot, Raigarh, Risgaon, Machka, Sihóla to Dhamtari.
- IX. Kánkér to Bustar.
- X. Bustar to Jeypur.
- XI. Jeypur, Sogaru, Padawa, down the Galikonda Ghât to Kasipuram.
- XII. Jeypur to Malkangiri and Moet.

(8.) POPULATION AND LAND AVAILABLE FOR IMMIGRANTS.—The people in the jungles are almost wild, and live in a semi-barbarous state, partly by the chase. They are mostly miserably poor, and dwell in small huts built of sticks and thatch. The small garden plots and spaces round their huts are fenced in with stakes as a protection against wild animals. Their agricultural operations are of the most primitive kind, and they have barely enough to sub-sist on. In the more civilized parts, in the large villages and towns, and in the well-cultivated tracts, such as the Dhamtari Taluk for instance, the people are comparatively well-to-do; they live in better houses, and have enough to live on and to spare for export.

There are large tracts of the best soil, now covered by jungle and forest, which offer a very promising field for immigrants. Such tracts are to be found in the zemindaries of Karial, Patna, Bodosamar, Nara, and Súarmal, in the Noagarh and Kánkér estates, as well as in Kálahundy, Jeypur, and Bustar.

21. I have much pleasure in recording my obligation to the authorities of the Central Provinces and to the Manager of the Bindra-Noagarh Estate, as well as to the Rajahs of Kánkér, Bustar, and Jeypur, for the ready assistance rendered to the reconnoitring party in the matter of guides, coolies, camp supplies, &c.

22. As the expedition is drawing to a close, I request your authority to hand over all Government tents, tools, stores, instruments, &c., belonging to my party, to the charge of the Executive Engi-

Ordered to store them at Vizagapatam.  
7th March.

neer at Waltair. Unless I receive other orders, I propose to embark at Vizaga-patam for Madras by the first steamer in April. Till then I beg that all com-munications may be addressed to me at Waltair.

NOTE.—I must ask your indulgence for the inferior caligraphy of this letter, and for all corrections, erasures, &c., as my writer is not very efficient.—K. F. N.

## XIV.

## A.

*Extract from Executive Engineer's Notes of Reconnaissance from Raipur to Ndrangpur via Rájim, Bindra-Noagarh, Háthgaon and Omorkót, 185 miles, 4 furlongs. January 15th to February 5th, 1882.*

*January 15th, 1882. Raipur to Khandwa en route to Noagarh. Height of Raipur*

Thermometer and aneroid readings.

55°

29° 3'

60°

29° 34'

58°

29° 38'

*5 miles, 0 furlong, 187 yards. Dumurtuli, village with tank and tope. Soil laterite covered*

60°

29° 38'

compared to the extent of cultivation. The laterite soil is occasionally varied by black clay, full of cracks and fissures in its present dry state.

*7th mile. Two culverts required, each with one vent 3 to 4 feet square. The general drainage is of an ordinary description; besides the bridges, noted as required in the report, about 4 to 5 culverts with vents, each 2 to 3 feet square, are wanted per mile.*

63°

29° 37'

68°

29° 35'

*10th mile. The village of Nemhora half a mile to the right; a fine tank by the roadside*

72°

29° 32'

*11 miles, 6 furlongs, 178 yards. Uparwara, village with tope, tank, gardens and wells. A*

76°

29° 36'

in the ground; half a mile further a swamp, with a stream, 6 feet by 4 feet. Laterite soil.

78°

29° 34'

*14 miles, 2 furlongs, 137 yards. Khandwa, village with tank, tope, gardens and extensive*

80°

29° 29'

fields. Soil laterite. Height above mean sea level 1,001 feet. Rise from Raipur 38 feet. A good made road runs from Raipur to this and further too, but it becomes gradually more and more neglected the further it goes. Avenue trees have been planted by the roadside, but they are not prospering owing to the manner in which they are protected, i.e., about a cubic yard of earth is being heaped round the base, whereby the tree is deprived of the necessary moisture, and the roots grow above ground in the earth heaped round the tree.

*January 16th. Khandwa to Rájim. Distance 11 miles, 2 furlongs, 118 yards. Thermometer 6 A.M., 57°; 11 A.M., 75°; 4 P.M., 80°. In the first mile occurs a small stream (Chittar nullah) 10 feet by 5 feet, in black soil, with muddy bed and high banks; a road bridge is about to be built here, for which red sandstone is being collected. The country is nearly all cultivated; there is very little waste land; the soil is mostly black; the chief crops are rice, wheat (ghóun), linseed (alsi), and Bengal-gram (chenna).*

*2 miles, 4 furlongs, 160 yards. Kolhán nullah, 20 feet by 10 feet, banks well defined; bed sandy with gravel. The village of Thanoud lies half a mile to the right; there is large tope near it; most of the villages here have fine topes; otherwise there are few trees about.*

*3 miles, 4 furlongs. On the summit of some gently rising ground a cross road running north and south. Topes and trees begin to occur more frequently than before, and there is some waste land about. Two small tanks by the roadside and a young mango tope; extensive rice fields.*

*5 miles, 3 furlongs, 154 yards. Sunderkhera, a large village with topes and tanks and extensive wet and dry fields. Soil chocolate coloured, with small stones and gravel (red sandstone); numerous mhówa trees about. The minor drainage required for the road is of an ordinary description, four to five culverts per mile, each 2 to 3 feet square, would suffice.*

*7 miles, 1 furlong. Parsáda, a large village with a tope. Babul trees plentiful especially by the roadside. Near the village is a nullah 35 feet wide and 8 feet deep, with gravelly bed and steep banks; no rock visible; soil black. A little further on two small tanks by the roadside. Linseed (alsi) is largely grown about here.*

*8 miles, 5 furlongs, 180 yards. Village of Ghónt; a nullah 15 feet wide by 10 feet deep, with steep banks and soft bed, in black soil.*

*10 miles, 1 furlong, 175 yards. Paragáon, a large village, with extensive groves of mango and tamarind trees and several tanks. Laterite rock is seen cropping out. Here the Mahánadi is crossed, about a mile above Noapára.*



The river is 1,908 feet wide between the banks, but in floods the northern or left bank, which is low (about 15 feet high), is inundated; the southern or right bank is 25 to 30 feet high. The low water in the deep bed at present is 1 to 1½ feet deep and 200 feet wide, the bed is sandy, but there is laterite rock on both banks. There is an island, with a temple, just below the junction with the Pairi river. The temple is dedicated to Kolésa Mahadéo.

*11 miles, 2 furlongs, 112 yards.* Camp on southern bank of Mahánadi in a fine tope near a temple, on the out-skirts of the town of *Rájim* where a zemindar lives. There is an Imperial Post Office, a Police station and a vernacular school here. The temple is considered a very holy one. The priests have in their possession three copper plates, joined by a copper ring with a seal; the plates are rectangular, measuring 12 by 9 inches, one-eighth of an inch thick, and bear an inscription in the Páli language; they are said to be very ancient and to contain the title deeds of the temple property. General Cunningham of the Archæological Survey has seen them and I believe taken a copy of the inscription.

*Rájim* is 917 feet above mean sea level. Fall from Khandwa 84 feet.

*Distance from Raipur 25 miles and 5 furlongs.* I halted two days at *Rájim* to dispose of some office work, as this is the last Post Office I shall meet until I get to *Nárangpur*.

*January 19th. Rájim to Kopra.* Distance 10 miles, 1 furlong, 206 yards. Thermometer 6 A.M., 49°; 11 A.M., 75°; 4 P.M., 79°.

Mean aneroid reading at *Kopra* 29.23. Passed through the town of *Rájim* and its fine topes; then over some waste land with black soil, the ground full of cracks and fissures.

The country is open; topes, fields and villages are seen in all directions. The crops are chiefly wheat, linseed and Bengal-gram.

*2 miles, 2 furlongs.* *Village of Chobebandha*, with gardens, wells, topes, and fields; the latter mostly wet. The village of *Sindhori* was left half a mile to the right. Black soil.

*4 miles, 2 furlongs.* *Baronda*, on high ground, with light soil and some red gravel. Fields gardens, tank and tope. The castor-oil plant, sugarcane, tobacco, and garden vegetables are grown. A spring channel (called *Damahúa nullah*) beyond the village requires a small bridge, 10 feet by 5 feet.

There are numerous wells about here, near the bank of the Pairi river, by means of which vegetables are cultivated. The water in the wells is about 8 feet below the surface. The village of *Chichond*, with a mango tope, was left a quarter of a mile to the east.

The river Pairi here is very broad and shallow, has a very gentle fall and inundates the country on its right or eastern bank. In the 6th mile is a shallow sandy *nullah* which is subject to floods from the river, and requires a waterway of 45 feet by 4 feet.

*6 miles, 2 furlongs.* *Kuraskera*, with several mango topes and extensive gardens. In the latter are found chillies, brinjals, castor, onions, garlic, beans, pumpkins, mustard, tobacco, and sundry vegetables. Soil light loam.

*8th mile.* *Tára*, a small village, with gardens, topes and several small tanks. The soil continues of a light description. Half a mile beyond the village a young *mango tope* is being reared. In the 9th mile is another and larger plantation of young mango trees, which are protected by basket work fences and seem well attended to.

*10 miles, 1 furlong, 206 yards.* *Kopra*, a large village with extensive fields, gardens and topes on high ground and light soil.

The Noagarh hills and jungles are seen looming in the distance.

*Kopra* is 931 feet above mean sea level. Rise from *Rájim* 14 feet.

*Distance of Kopra from Raipur 35 miles, 7 furlongs.*

*January 20th. Kopra to Bourka.* Distance 12 miles. Thermometer 6 A.M., 49°; 11 A.M., 82°; 4 P.M., 78°.

The soil south of *Kopra* is alternately black and light; there are large rice fields; wheat is becoming scarcer; some waste land is seen, and some land lately reclaimed from the jungle.

At 1½ mile a *stream* is crossed, called *Bhór nullah* 10 feet by 5 feet, with high banks and soft bed. The route lay along the bank of the Pairi river, which is here broad and shallow, and has very little fall. At 2½ miles the village of *Surkunda* with a tope, gardens and well, and numerous cattle. Sugarcane and plantations are grown. Then begins *jungle*, as yet of a light description; a tank is passed; the village of *Panduka*, where there is a Police station, is left to the east. I did not go by the bandy track to *Panduka*, as I wished to keep along the river bank where the railway should be made; the bandy track crosses a small *ghât* near *Bourka*. The soil is mostly black and much cut up by cracks, fissures and holes.

*Traffic.*—Several large gangs of Brinjarri bullocks were met, carrying rice and wheat southwards.—In the fourth mile a *tank*. Then the *village of Kuténa* (4 miles, 1 furlong). Some light jungle about here; and sandstone rock is seen cropping out. In the 5th mile begins the regular *jungle* again, and gradually becomes denser. A small stream is crossed, 9 feet by 4 feet, with good banks and hard bed, a tributary of the Pairi river. Soil light. At 5½ miles occurs a large *plantation of sugarcane* on the river's bank. Near this a stream, flowing into the Pairi, 25 feet wide and 8 feet deep in flood, with steep banks and a goop hard crossing. Here the *gneiss formation* begins again; no more limestone rock or sandstone; much gneiss rock is seen cropping out; kunker nodules lying on the surface; there are some patches of cultivation in the jungle.

At the 6th mile are large rice fields on rather high ground in the jungle, rudely cultivated without visible means of irrigation, by rain water most likely, in the wet weather; they are now dry.

6 miles, 4 furlongs. The village of Kúda. Some rice fields. Thin scrub jungle all round. Light clayey soil with sand. Some laterite is seen cropping out, but the prevailing rock is gneiss. In the 8th mile much rock occurs along the bank of the river, and the jungle becomes very dense. A few patches of swampy soil are met with, roughly cultivated. The route continues along the river's bank; the soil is alternately stony and swampy; some high rocky ground to the left. Jungle dense.

9th mile. A nullah, 12 feet by 5 feet, with steep banks and soft crossings; close by two smaller nullahs 7 feet by 4 feet each, another 9 feet by 4 feet, and a fifth 12 feet by 5 feet; the last four with stony crossings.

9 miles, 3 furlongs. Páhpur, the site of a deserted village, belonging to Bourka; a few huts are left standing; there are very few signs of cultivation about; the place looks an unmitigated wilderness. At 9½ miles, two small nullahs close together, each 9 feet by 4 feet; the ground here is broken, and the soil stony and rocky, the jungle dense, the grass high. The rocky hill side rises from the bed of the river; and some hill side cutting for about a mile would here be required for the road.

11th mile. A nullah, in a swamp, 25 feet by 6 feet. Banks ill defined; bed sandy.

12th mile. Bourka, a small village in a jungle clearing, a swamp partly cultivated, surrounded by rocky hills well wooded.

Mean aneroid reading at Bourka 29·21, height above mean sea level 992 feet. Rise from Kopra 61 feet. The place is spelt Bourka on the map, but the people pronounce it Bárka.

Distance of Bourka from Raipur 47 miles, 7 furlongs.

21st January. Bourka to Dongriga. Distance 9½ miles. Thermometer 6 A.M., 43°F.; 11 A.M., 80°; 4 P.M., 80°.

The rough bandy track, such as it is, leads from here over some gently rising flat ground, with hilly jungle on both sides, which offers no obstacles to road or railway. Some rude rice cultivation in a swamp on sloping ground is met.

The low hill ridges accompanying the track on either side are well wooded; the soil is hard and gravelly, much nodular kunkur limestone lies about on the surface. A little further on, the track leads for some distance along the slope of the ridge on the left, from which much drainage descends that crosses the road and will require a culvert, 3 feet to 4 feet square, per furlong. There is not much rock here; what there is, is gneiss decomposed on the surface, and conglomerate. Near the end of the 2nd mile the line runs close to the bank of the Pairi river which is here shallow and broad, with but little fall, and overflows its banks.

2 miles, 1 furlong. Stream 10 feet by 4 feet; low banks and sandy bed. The track is cleared of jungle to a width of 15 to 20 yards, and the surface has been roughly improved for cart traffic in the dry weather.

At 2½ miles, two streams, not far apart, each 10 feet by 4 feet.

At 3½ miles a large clearing in the jungle with some cultivation. Not far from this is the village of Kúrti, on the other side of the river. Kurubata lies to the left, with a tank and extensive rice fields.

4 miles, 5 furlongs. Village of Malga, situated on the hill side, somewhat above the general level of the country.

5th mile; cross the Pairi river, here 1,580 feet wide. The bed is sandy and there is no rock visible. The northern bank is not well defined, low and subject to inundation during floods; the southern bank is steep and rises 12 feet above the bed.

The high floods are said in some years to rise 6 to 8 feet above this bank and to submerge the country up to the village of Manjarkata, which is at 6 miles, 1 furlong. On the southern banks of the river the jungle is largely cleared, some apparently quite lately, and the ground is well cultivated. The village of Chikli is left on the right.

Rice, sugarcane, Bengal-gram, linseed, castor-oil and tobacco, besides vegetables, are grown; wheat is no longer met. The soil is mostly black. A small tank (bhandhábúla) is near the track. Some sheet rock (gneiss) appears above the surface.

7 miles, 1 furlong. Village of Amdí, with some cultivated fields; then jungle again; the country here is quite flat. At 7½ miles a small nullah, 12 feet by 5 feet.

7 miles, 6 furlongs, 142 yards. A larger nullah 55 feet wide, with low perpendicular banks, 4 feet high, which are said to be covered by extraordinary floods to a further depth of 3 feet. The water-way required to be provided to pass such floods is more than twice that contained between the banks.

8th mile. The village of Paraga, where the Manager of the Noagarh estate lives; the young Rajah, a minor, being in school at Raipur. There is a Police station at Paraga. Some good gardens are here; an avenue of young mango trees has been planted and is taken care of.

From Paraga to Noagarh, a distance of 15 miles, there is uninterrupted jungle, without a single village. The villages that once existed have been deserted.

A swamp is met near Paraga; then the jungle begins, through which a track has been cleared 15 to 20 yards wide, and the surface has been improved for cart-traffic. There is much sheet rock about (gneiss) and some conglomerate, called Choári in Hindustani.

8 miles, 5 furlongs. A shallow nullah, 20 feet by 4 feet, with low banks and sandy bed.

9 miles, 3 furlongs, 105 yards. Dongriga, the site of a deserted village, near the Bamni Dévi rock (which looks like a ruined castle). There are no traces of cultivation left; the jungle



grows all round the place, which is said to have been deserted by the villagers on account of the numerous wild animals about here.

The mean aneroid reading at Dongriga is 29·04 feet.

Height above mean sea level 1,130 feet.

Rise from Bourka 138 feet.

Distance of Dongriga from Raipur 57 miles, 2 furlongs, 126 yards.

January 22nd. Dongriga to Noagarh. Distance 13 miles, 1 furlong. Thermometer 6 A.M., 46° F.; 11 A.M., 86°; 4 P.M., 80°.

In the first furlong the *Dongriga nullah* is crossed, 35 feet wide and 7 feet deep in flood, with a sandy bed, but rock for foundations near; the banks are about 5 feet high and well defined, they are flooded in the rains.

The track through the jungle continues to be cleared to a width of from 15 to 20 yards, and is made passable for carts. The soil is alternately swampy and stony, and embankments will be required in several places. The ground level is slightly undulating, the drainage ordinary, mostly from left to right. The jungle is small but dense, there is no large timber in the first mile.

1st mile, a shallow stream, 12 feet by 3 feet. At 1 mile, 3 furlongs, 146 yards, Tírnai nullah, a stream 35 feet wide at bottom and 5 feet deep, with low banks, sloping at 1 in 30, and sandy bed; no rock. There are some tall forest trees here in the jungle, matti (sája) and sál (sarái) predominating. Some rock is seen near the surface, chiefly gneiss; much quartz is lying about in fragments.

The soil is alternately hard and gravelly, then sandy or clayey loam. Much tall young timber, chiefly sál; fine straight poles.

1 mile, 7 furlongs. A stream 9 feet by 3 feet. Ground undulating.

2 miles, 6 furlongs, 54 yards. Bugai nullah, a stream 35 feet wide with irregular sloping banks and sandy bed; rock for foundation near at hand; the rock is a kind of decayed gneiss called "Darraputtar" in Hindi. Then some rising ground and stony soil.

3 miles, 1 furlong. A small drainage channel 6 feet by 4 feet, flowing to the left. In the same mile there are several more small drainages like the above, all leading from right to left. There is no cultivation here; all jungle and tall grass, upon a hard but fertile soil. Ample space for agricultural operations.

4 miles, 1 furlong, 40 yards. Aneroid reading 29·06. Korihardi nullah, a shallow stream with low irregular banks and sandy bed; probable section in flood 25 feet by 3 feet. There was a village of Karihardi here, some twenty years ago, which, the people say, has been deserted on account of the depredations of wild animals. The ground continues to rise gently; the jungle is tall, with little underwood, but high grass; the soil is hard and gravelly. Further on the ground undulates again, and some hill-side cutting will be required for the road; but not much. Good matti timber is abundant.

In the 5th mile is the Mogai nullah draining to the right, and measuring 16 feet by 4 feet.

The jungle here is hilly and stony, and the ground irregular. The track leads over the Urtuli Ghát, a small ascent, about 120 feet in perpendicular height. The track is taken straight up the hill-side, while the new road or railway should keep lower either to the right or left where there is enough room for a gradient of 1 in 100. Much quartz is lying about the surface; reefs of it, and large veins in gneiss rock, occur in several places about here.

5 miles, 5 furlongs, 187 yards. Head of the Urtula Ghát.—Aneroid reading 28·93. From here the track descends again; but, as before stated, the rail need not be taken up so high as this. Further on, the ground becomes flat again, only now and then gently undulating. Some grassy plots—pretty glades—are seen here and there in the jungle; they are swampy in the rains, I suspect.

Aneroid 28·95.

7 miles, 4 furlongs. Near the deserted village site of Joba; with patches of grassy swamp, now dry.

8th mile, a nullah draining to the right, 5 feet by 3 feet; black soil. Then some gently rising ground.

8 miles, 4 furlongs; a nullah, 6 feet by 4 feet, in stony soil.

9 miles, 1 furlong, 172 yards. Summit of low rise. Descent very gradual from here; the cleared track through the jungle continues, but only 10 yards wide; the surface improvements become scarcer.

Aneroid 28·95.

Some broken and irregular ground; stony; a small drainage culvert required 3 feet square; another 7 feet by 3 feet.

10 miles, 1 furlong, 152 yards. Teregi nullah, 15 feet wide and 9 feet deep, in soft soil,

Aneroid 29·03.

Thermometer 72°.

with steep banks; no rock. Much young sál-wood grows here, good straight poles, 50 feet high and 1 foot in diameter. The jungle consists largely of sál; there are also many matti trees. No bamboo is seen about here.

Aneroid 29·01.

Thermometer 80°.

11 miles, 2 furlongs, 170 yards. Kasoni nullah, 20 feet by 4 feet; sandy bed, but rock for foundations at hand.

11 miles, 5 furlongs. A nullah 12 feet by 5 feet, in a swamp. Then again good, hard soil. Some undulating ground, involving cutting and embankments, and occasional hill-side cutting; but only on a small scale.

12 miles, 5 furlongs, 110 yards. *Harpali nullah*, 25 feet by 7 feet, sandy bed; steep banks; rock for foundations. Here the track to *Kusmi* branches off to the south-west. Much sheet rock (gneiss) cropping out between this and Noagarh.

Aneroid 28-97.  
Thermometer 84°.

13 miles, 1 furlong, Noagarh, a small village, containing about 40 mud huts, besides the Zemindar's buildings (which are also of mud, timber and thatch); situated at the foot of a rocky hill which has a temple. The village and its fields are placed in a confined, ill-ventilated space, on irregular ground, with rocks and swamps about, and

11-30 A.M.  
Aneroid 28-96.  
Thermometer 85°.

three or four stagnant tanks.

There is no need for bringing the railway to Noagarh; it can be taken over lower and better ground between this and the river Sondor, some 4 or 5 miles west of Noagarh; or better still, entirely along the river, *i.e.*, within half a mile or so of the bank.

January 23rd. Halted at Noagarh, and despatched one camp ahead to Balétma, which is on the Sondor river.

The mean reading of the aneroid battery at Noagarh is 28-82; height above mean sea level 1,314 feet.

Rise from Dongriga 184 feet. Distance of Noagarh from Raipur, 70 miles, 3 furlongs, 154 yards.

Detached Aneroid 28-95.

January 24th. Noagarh to Baltéma. Distance 10 miles, 6 furlongs, 131 yards. Thermometer 6 A.M., 57°; 11 A.M., 78°; 4 P.M., 82°.

Returned to the *Harpali nullah*, where the track to *Kusmi* branches off.

From here the ground becomes somewhat irregular and the jungle is pretty dense; the soil as a rule is light and sandy, rather stony, occasionally rocky; the drainage is of an ordinary description and runs from left to right. The track leads up and down, but mostly up-hill at easy gradients. Some hill-side cutting would be required, but not much.

Detached Aneroid 28-94.

At 1 mile, 2 furlongs, 165 yards, the summit level of the rise is reached.

1 mile 4 furlongs. *Murgi nullah*, 15 feet by 4 feet. Much young sâlwood and high grass.

2 miles, 1 furlong, 168 yards. *Teregi nullah*, 15 feet by 7 feet; the same that was crossed on the 22nd at a lower part of its course. Here is an abundance of *quartz*, white, pink, red and black, scattered about the surface. The soil is hard and gravelly. Both the *Murgi* and *Teregi nullahs* flow from left to right, have steep banks, a rapid fall and sandy beds with stones.

2 miles, 6 furlongs. A clear spot in the jungle, somewhat swampy; the sight of the deserted village of *Bardul*, said to have been left by the people 10 years ago on account of the numerous wild animals about. But this is scarcely a satisfactory explanation; there must be some other cause for this and other villages in these parts being deserted. Not a vestige of a house remains at *Bardul*, and scarcely any sign of cultivation, except the jungle clearing. The ground here is no longer hilly, but flat.

3 miles, 5 furlongs. *Satigat nullah*, 60 feet wide at bottom, 8 feet deep; bed sandy, with gravel and loose stones. Banks high, and sloping at an angle of about 45°. The soil here is light sandy loam, on which grows the ordinary jungle and some tall grass. The track has been cleared of trees and bushes, 5 to 6 yards wide, and is passable for carts.

In the 4th mile is a large area of deserted fields in the jungle which have apparently not been cultivated for some years; this belongs to the village of *Kusmi*.

4 miles, 2 furlongs, 190 yards. *Kusmi nullah*, 60 feet by 8 feet, of the same size and nature as the *Satigat nullah* in the 4th mile.

4 miles, 4 furlongs. A small drainage channel, 6 feet by 2 feet.

A temple of *Mâta Dévi*, *i.e.*, a rude mud-and-thatch hut, surrounded by wooden palisades as a protection against intruders, both men and animals. Then another small streamlet, 6 feet by 2 feet.

5th mile. Village of *Kusmi*, consisting of about 25 huts, containing 60 people, in a large jungle clearing, with extensive wet fields on rich soil; a small tope and a good herd of cattle. Then jungle again, at first light scrub, then dense with young sâl and some *matti* trees. Soil, light sandy loam; a few masses of gneiss rock showing above the surface. On the left, about a mile off, is a hill, marked on the map 2,366 feet high, or about a thousand feet above this village. Between this and the 7th mile four larger culverts are required, averaging 7 feet by 3 feet.

7 miles, 5 furlongs. Village of *Boirga*, six huts in a small jungle clearing, enclosed by palisades as a protection against wild animals. Very little cultivation, although the soil is good. There are signs of *sâmbhur*, bison, and wild pig about. Next to the village is a swampy glade: a grass plot in the jungle, on black soil, which will be difficult to pass in the rains. Two furlongs further a track, *i.e.*, a foot-path, branches off to the right, leading to *Amaróra*, through a young sâl forest 10 to 15 years old, with tall grass. The path we follow is very slender, sometimes scarcely visible, but the grass and brushwood along it have been cleared a little by the party sent on yesterday.

9 miles, 2 furlongs. *Kolbóra nullah*, 15 feet wide at bottom, 4 feet deep; banks sloping at an angle of 30°; sandy bed, but rock for foundations at site. The rock is gneiss (in Hindi *Gaunba*). All jungle, no cultivation. Ground slightly undulating.



9 miles, 5 furlongs. *Budra nullah*, 35 feet wide, 6 feet deep; steep banks; sandy bed, no rock.

Tall grass, 7 to 10 feet high.—A swampy glade; then again jungle of young *sâl* trees, with scrub and brushwood. Indeed, for the last 40 miles of this march the country has been one uninterrupted jungle, except at the few miserable villages met.

10 miles, 4 furlongs. *Amajóri nullah*, 25 feet wide, greatest depth 5 feet.

One bank high, the other low and flooded; bed sandy, no rock visible.

10 miles, 6 furlongs, 131 yards. *Baltéma*, a wilderness with eight miserable huts, built of sticks and thatch, inhabited by about 20 people all told, most of whom had run away last night at the approach of the advance camp; no signs of cultivation to be seen.

Mean reading of aneroid battery at *Baltéma* 28·83; height above M.S.L. 1,295 feet.

Fall from Noagarh 19 feet. Distance of *Baltéma* from Raipur, *viâ* Noagarh, 81 miles, 2 furlongs, (deducting 1 mile for the distance, from Harpali nullah to Noagarh, travelled over twice). But along the Sondor river—where the railway should go, instead of *viâ* Noagarh—the distance is only 75 miles and 2 furlongs—*Baltéma* has a reputation for tigers. The Manager of the Bîndra-Noagarh estate, who was most solicitous for our welfare, furnished each tent in camp and each horse with a guard of two jungle men to keep the tigers off. Fire-wood was plentiful, and the guards slept peacefully, roasting themselves within a few inches of the blazing fires. No tiger came.

January 25th. *Baltéma to Tumaribahâl*—Distance 12 miles. Thermometer 6 A.M., 50°; 11 A.M., 84°; 4 P.M., 84°.

Passed through low scrub jungle, with young *sâl* trees and tall, thick grass over rich, dark soil that must be swampy in the rains. In the first half-mile crossed two small drainage channels, 5 feet by 3 feet; the ground in parts uneven.

1 mile 2 furlongs. *Pendra*, a village partly deserted, and rebuilt on another site. Soil reddish, sandy loam with gravel. Then three small nullahs, 5 feet by 3 feet: the ground still uneven.

1 mile 6 furlongs. A small stream, 10 feet by 4 feet, with clear water running in it.

2 miles, 2 furlongs. The present village of *Pendra* in a new clearing.

2 miles, 4 furlongs. *Marîa nullah*, 10 feet by 3 feet; uneven and broken ground.

2 miles, 6 furlongs. *Parsâ pâni nullah*, 15 feet by 4 feet. Much quartz about here.

3 miles 70 yards. *Jâmun nullah*, 9 feet by 3 feet. A little further on a 3-foot culvert is required.

3 miles, 5 furlongs. *Pulbhari nullah*, 25 feet by 4 feet; perpendicular banks, sandy bed; some rock for foundations near.

3 miles, 7 furlongs. *Serai nullah*, 12 feet by 4 feet. *Sâl* jungle and tall grass. Traces of bison, *sâmbhur*, pig and bear.

4 miles, 2 furlongs. *Jarr nullah*, 20 feet by 5 feet, with steep banks and rocky bed.

The track (which is barely visible) here crosses a number of spurs running out from the hills on the left.

4 miles, 3 furlongs, a small drainage channel, 4 feet by 2 feet. Ground uneven; a succession of spurs; soil hard and stony. The railway should keep close to the river's bank. A hill covered with fragments of quartz, near the right bank of the Sondor, about opposite the village of *Jounra* which is on the left bank.

4 miles, 5 furlongs. *Small nullah*, 4 feet by 2 feet. The soil is quartz gravel.

4 miles, 7 furlongs. *Chicklâ hi nullah*, 15 feet by 3 feet; rocky bed. The rock is gneiss, with patches and veins of pink quartz, alternating with conglomerate.

5th mile, small nullah, 8 feet by 3 feet.

5 miles, 2 furlongs. *Gobra*, a deserted village; the ten huts, built of sticks and thatch, remain standing, (the walls are made of *sâl*wood poles placed perpendicularly in the ground; they are 4 feet high at the sides and 8 feet up to the ridge pole; sometimes the spaces between the sticks are closed with mud, but not always. There is only one opening: a door 4 feet by 2 feet.) The people are said to have left about four months ago on account of sickness. No clearing or traces of cultivation near.

5 miles, 3 furlongs. A 3-foot culvert required.

Soil stony: quartzose, gneiss, and conglomerate.

5 miles, 7 furlongs, 205 yards. *Gôgor nullah*, 8 feet deep, 60 feet wide; steep banks, level, sandy bed with some rock; a good bridge site is available 2 furlongs higher up the stream which there flows over solid rock between steep rocky banks.

The jungle about here is dense and looks very wild; there is, besides the trees and bushes, tall coarse grass of two kinds, some with thick round stems, some with long flat leaves; the slender path is barely visible.

6 miles, 5 furlongs. *Kâtipâra*, site of a deserted village said to have been left three years ago. Good, fertile soil.

Here is the boundary of the Noagarh estate. We now pass into the *Sihôa Ilâga* of the Dhamtari Tâhseel.

The country is flat again and the ground even. At the 7th mile a marshy glade in the *sâl* jungle. A little further on the soil is sandy clay with fine gravel.—Some uneven ground again.

7 miles, 4 furlongs. Two culverts required, 4 feet by 3 feet.—Then some sheet rock (gneiss). Fine young forest, chiefly *sâl*.

8 miles, 3 furlongs, 110 yards. *Burrpani nullah*, 10 feet by 4 feet. Wild jungle and tall grass.

In the 9th mile two small nullahs, 5 feet by 3 feet. Ground flat, sometimes swampy.

9th mile. *Múra Córa nullah*, 10 feet by 4 feet. Grand old forest, chiefly of sâl and matti; but little brush and underwood.

10 miles, 3 furlongs, 170 yards. Junction of *Dhour* and *Sondor* rivers.

Cross the *Dhour* 100 yards above the junction 65 feet wide, 9 feet deep in flood, steep banks, sandy bed, no rock.

10 miles, 6 furlongs. *Tenai*, three or four small huts of sticks and thatch in a jungle clearing. There are signs that the place has been better inhabited formerly. A 4-foot culvert required.

11th mile. Signs of former rice-fields in a clearing; soil dark and swampy.

12 miles. *Tumaribahál*, a small village of a dozen huts, with some gardens and a few rice-fields. Castor, pumpkins, beans, hybiscus, chillies, brinjals and tobacco are grown near the huts. Young mango trees have been planted and are fenced in by upright sâl poles, 6 inches thick and 6 feet high, being let into the ground and forming a circle round the tree 3 feet in diameter. This is a very effective protection and gives the young trees enough light, air and moisture. The village is near the right bank of the *Sondor* river, which is here 150 feet wide and 10 feet deep in flood, and has regular and steep banks, and a sandy bed with rock here and there. A very good encamping ground on the river bank, in an old clearing planted with young mango trees.

The mean reading of the aneroid battery at *Tumaribahál* is 28°66. Height above mean sea level 1,441 feet.

Rise from *Baktéma* 146 feet.

Distance of *Tumaribahál* from *Raipur* 93 miles, 2 furlongs.

January 26th. *Tumaribahál* to *Risgáon*. Distance 10 miles, 5 furlongs, 170 yards. Thermometer 6 A.M., 48°; 11 A.M., 87°; 4 P.M., 84°.

The track leads along the bank of the *Sondor*, through stately jungle.

In the 6th furlong *Mudibahal*, a deserted village; a few sticks left standing; the people are said to have moved their village to another site.

First mile, a few solitary ploughed fields in the jungle. Ground flat; soil light and soft; sandy clay; jungle thin with some clearings and natural grass plots. A watercourse, 5 feet by 3 feet, in a small swamp, just outside the village of *Kasráor*.

2 miles, 4 furlongs, 152 yards. *Kasráor*, four huts containing about twenty inhabitants; a few fields, no gardens. A blacksmith is in the village. The people here still speak *Chattisgarhi*, a dialect of *Hindi*.—High hills to the left, a peak is marked 2,445 feet on the map.

3 miles, 100 yards. *Kámunkór nullah*, 15 feet by 4 feet; steep banks, soft bed. Tall rank grass, then forest of sâl; ground slightly undulating.

3 miles, 2 furlongs. *Kauribahár nullah*, 15 feet by 5 feet. Soil, light sandy clay.

4 miles, 194 yards. *Tél Dhorigi nullah*, 20 feet by 5 feet; steep banks; bed, hard soil and gravel.

4 miles, 4 furlongs, 160 yards. *Bórpodór village*, fifteen huts with sixty inhabitants: rice-fields and gardens; some date-palms; south of the village the *Katasaru nullah*, 25 feet by 5 feet, partly dammed up and converted into rice-fields.

5 miles, 2 furlongs. *Kunnár nullah*, 20 feet by 5 feet, with clear running water; rocky bed; banks sloping at an angle of 45°. Then some undulating ground with young sâl jungle.

5 miles, 7 furlongs. *Jhurra nullah*, 15 feet by 5 feet. Underwood and grass very thick; no track; some people have to go ahead to clear a path; slow progress.—Small drainage channel, 6 feet by 3 feet.

6 miles, 6 furlongs. *Káser nullah*, 12 feet by 5 feet, a stony watercourse with rocky bed. A good deal of rock about here, and the ground somewhat undulating; a high hillock to the left, half a mile distant.

7th mile. *Urai nullah*, 8 feet by 3 feet. Undulating and stony ground.

7 miles, 3 furlongs, 146 yards. *Lafni nullah*, 18 feet by 5 feet, with a rocky bed. Much quartz in small fragments about the surface.

7 miles, 7 furlongs. *Kissi nullah*, 15 feet by 4 feet

8th mile; a small ploughed field, quite solitary in the jungle.

8 miles, 3 furlongs, 100 yards. *Karha*, a small village containing five huts with 25 people: some fields and gardens. The people here speak *Ghóndi* besides *Chattisgarhi*. A man addressed me as "*Máprábu*," instead of *Jihó* or *Máharáj*, as hitherto.

8 miles, 6 furlongs; cross the *Bag nullah* (near its confluence with the *Sondor*), 50 feet wide, 9 feet deep; steep banks, sandy bed, no rock. Brinjarris with gingelly-seed going to *Párvatipuram*; others with salt coming from *Sálúr*. The latter said they had been 25 days from *Sálúr* and would take 10 or 12 days more to reach *Dhamtari*.

(*Risgáon* is in the regular trade route from *Sálúr* and *Párvatipuram* to *Dhamtari* and *Raipur*).

They go from *Risgáon*, *viâ* *Kálgád*, *Sankra*, *Ránigáon*, *Malleri*, *Sirsída*, *Sihóá*, *Sémra*, *Birgúdi*, *Gatigáon*, *Gatásili*, *Dókal*, *Bunbugowd*, *Kukrel*, *Bhoina*, *Achóta* and *Koliari* to *Dhamtari*. But this route is not suitable for a railway on account of the irregular ground it passes over.



10 miles, 5 furlongs, 170 yards. *Risgáon*, 15 huts with 60 people. Fields, gardens and a tamarind grove. The camping ground is small and too near the village, also near a swamp; but the headman (or *Malgúzár*) said the place was healthy.

Mean reading of aneroid battery at *Risgáon* 28·53.

Height above mean sea level 1,569 feet.

Rise from *Tumaribahál* 128 feet.

Distance of *Risgáon* from *Raipur*, 104 miles.

*January 27th. Risgáon to Háthgáon.*—Distance 8 miles, 7 furlongs. Detached aneroid 28·63. Thermometer 6 A.M., 44°; 11 A.M., 77°; 4 P.M., 82°.

There had been heavy dew at night, and it was a crisp, cold morning. This day we had to ascend some of the last steps to the *Jeypur* plateau, to which the valley of the *Sondor* river has been gradually leading up. The track in the first furlong lay through a swamp drained by a nullah, 20 feet by 5 feet. The jungle at starting was light, with some swampy ground in places. At the 7th furlong is the site of the deserted village of *Kursudi*, said to have been

abandoned on account of depredations and exactions committed by the *Brinjarris*. The *sál* jungle around is pretty, with occasional grassy glades; there are some young teak trees in the jungle; the soil is light sandy loam, except in the swamps and glades where it is dark, stiff clay.—All jungle.

2 miles, 4 furlongs. A small drainage 6 feet by 3 feet; half a mile further three more nullahs like the last. The ground is slightly undulating and steadily rising, but gently. Aneroid 28·57.

3 miles, 5 furlongs, 117 yards. *Paudripáni nullah*, 10 feet by 4 feet. Fine tall jungle, and forest trees; aneroid 28·58.

3 miles, 6 furlongs, 150 yards. The track crosses the *Soreá* river, 65 feet wide at bottom, 10 feet deep in flood; sandy bed with some rock; one bank low and and flooded, the other high and steep. This river need not be crossed by the railway which should keep on the right bank.

4 miles, 1 furlong. The site of *Gourgáon*, a deserted village; the people are said to have left on account of *Brinjarris*, and settled in another place away from the beaten track. A number of young mango trees are planted on the site, and fenced in by upright *sál*wood poles, 5 to 6 feet high. The soil is rich clay. Aneroid 28·57. The country here is flat; hills are seen in front and to the right. There are some rice fields, belonging to *Gourgáon*, which have not apparently been cultivated for some time.

4 miles, 4 furlongs, 145 yards. A deep nullah, 15 feet by 5 feet; in clayey soil. Then low scrub jungle and coarse long grass.

At 5 miles, 1 furlong, the track crosses the *Soreá* river again; but the railway would remain on the right bank, as explained *supra*. Along this right bank the railway should be taken up to *Samrathdái* and *Dindaúdi*, towards *Kóliapodór* and *Raigarh*.—Here is fine old forest, with large *matti* and *sál* trees, also some teak. The ground is undulating and irregular for some distance; then it becomes flat again. The soil is rich. *Sál* jungle continues.

At the 7th mile we leave the Central Provinces and enter *Jeypur* territory. Aneroid 28·47.—A drove of pack-bullocks, from *Sálúr* to *Dhamtari*, with salt.

7 miles, 4 furlongs; a small drainage to the left, 8 feet by 3 feet. Then some undulating ground.

8 miles, 6 furlongs; a swamp with black soil. Forest of *matti* and *sál*.

8 miles, 7 furlongs. *Háthgáon*, a small village containing five huts and about 25 people,

who are not so miserably poor as in some of the villages met along the route for several days past. There is quite a flock of small children, and the headman is building himself a new and roomy hut. The people here speak *Ooriya* and *Ghóndi*, the latter a dialect of *Chattisgarh* *Hindi*; but they understand *Hindustani* well enough.—No arrangements had been made here by the *Jeypur* agency for supplies, &c., for the party; and the Manager of the *Bindra-Noagarh* estate continued to afford his assistance.

No ghât, except the small *Urtáli Ghât* (on the 22nd) which can be circumvented, has been encountered on this route so far, and no sudden changes of level; the ascents have been gradual and easy, the undulations of the ground but slight; nothing to constitute an obstacle to the railway. The gradient need nowhere exceed 1 in 100. The jungles are magnificent, the soil is good; but villages are few and far between and the population is exceedingly sparse. There are hundreds of square miles of good forest land in the *Bindra-Noagarh* estate that might be colonized with advantage alike to the colonists and to the administration.

The mean reading of the aneroid battery at *Háthgáon* was 28·22.

Height above mean sea level 1,870 feet.

Rise from *Risgáon* 301 feet in 9 miles; about 1 in 150 or 33½ feet per mile.

Distance of *Háthgáon* from *Raipur* 113 miles.

*January 28th. Háthgáon to Raigarh.*—Distance 11 miles. Detached aneroid at 6 A.M. 28·38. Thermometer 6 A.M., 50°; 11 A.M., 86°; 4 P.M., 81°.

On leaving the village the track crosses a swamp and some rice fields; then through high grass and jungle, chiefly *sál*. There is a steady ascent which can be eased by keeping along the *Golária* nullah to the left. In the first mile we rise about 40 feet, the aneroid at the end of it reading 28·34. Then come repeated ascents and descents (but not very steep or high) which, combined, the *Brinjarris* call the *Paramári Ghât*.